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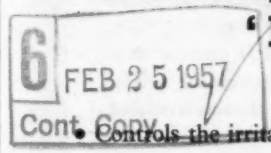

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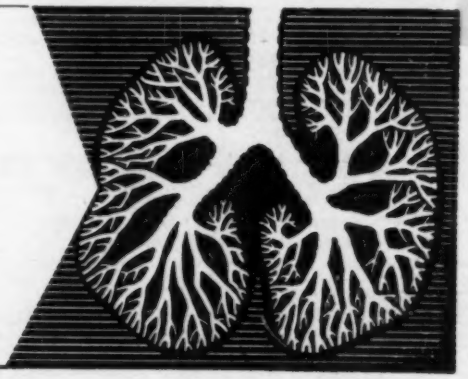

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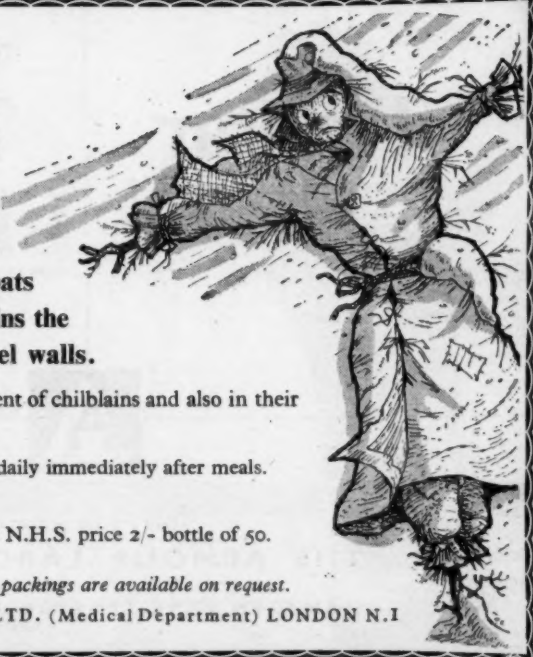

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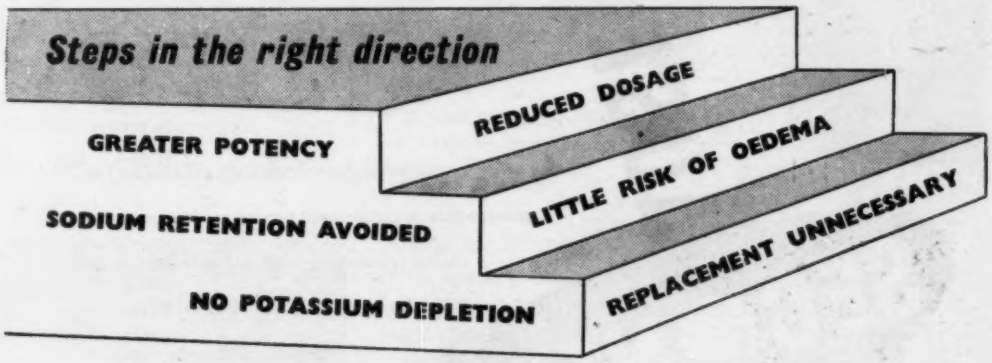

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or **Di-Adreson-F** (PREDNISOLONE) Δ1-Dehydrocortisol

Is prescribed instead of Cortisone Acetate

Both DI-ADRESON and DI-ADRESON-F are now generally prescribable and are supplied in scored tablets 5 mg. Bottles of 30 and 100. Full literature available on request.

ORGANON LABORATORIES LIMITED

BRETTENHAM HOUSE, LANCASTER PLACE, LONDON, W.C.2. Telephone: TEMple Bar 6785-6-7 & 0251-2.

Tryptar

PURIFIED CRYSTALLINE TRYPSIN

For Physiologic
Debridement of Necrotic Tissue,
Intrapleural Use

Tryptar

AEROSOL

For Bronchial Asthma
Acute and Chronic Bronchitis,
Bronchiectasis and Atelectasis

Write for literature to :

Telephone : Hampden Park 740

THE ARMOUR LABORATORIES
(Armour & Company Ltd.)
HAMPDEN PARK, EASTBOURNE, SUSSEX

Telegrams : Armolab Eastbourne

MENOPAUSE

SECONESIN

Seconesin, has proved most suitable for the management of menopausal symptoms. It relaxes and calms emotionally tense and anxious patients without making them drowsy. Subjective improvement, with a sense of well-being, occurs early in treatment in almost all cases.

PACKINGS: Bottles of 25, 100 and 500 tablets.

THE CROOKES LABORATORIES LIMITED • PARK ROYAL • LONDON NW10

Gypsona
TRADE MARK

has stood the test of time

Soaks more readily than hand-rolled bandages.

Sets firmly in four to five minutes.

Stronger yet less brittle than ordinary plaster.

Casts have porcelain-like surface.

Casts are porous.

Trimmed edges do not crumble and casts have a neat appearance.

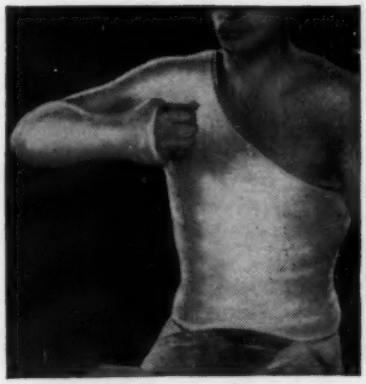
Casts may be bivalved, or cut open and sprung apart without loss of strength.

Exact number of bandages for a particular cast can be determined beforehand.

Special interlocked woven cloth permits easy moulding.

High plaster content—90% of plaster by weight.

Will keep for a very long time without deterioration when stored in a dry place.



The absence of loose powder and the non-fray edges of the specially-woven leno cloth base of Gypsona bandages provides a distinct advantage over hospital-made bandages.

In performance, the superiority of Gypsona is even more marked. The high plaster content is fixed to the fabric by a special process, and there is a negligible loss of plaster when the bandage is soaked. A surprisingly small amount of material will produce a cast which is light, but of great strength.

Gypsona is by far the most economical plaster for the modern functional treatment of fractures.

SMITH & NEPHEW LTD · WELWYN GARDEN CITY · HERTS (S&N) Gypsona TRADE MARK

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A QUALITY PRODUCT OF MODERN NUTRITIONAL SCIENCE

'VIMALTOL' is a concentrated vitamin food, formulated by and prepared under the control of the 'Ovaltine' Research Laboratories—which are actively investigating problems in nutrition and dietetics. They bring to its manufacture a high degree of scientific knowledge and a meticulous standard of hygiene.

'Vimaltol' contains malt extract, yeast, halibut liver oil and iron. Every ingredient used is rigidly tested for purity and quality, the final product being accurately standardized for vitamin content.

In addition to its vitamins, 'Vimaltol' provides valuable nutrients of undoubted assistance to infants, fast-growing children, nursing mothers and to those whose diet is inadequate or unbalanced. It helps to build up strength, weight and the natural powers of resistance. 'Vimaltol' is highly palatable—a decided advantage when recommending it for children.

A Product of the *'Ovaltine' Research Laboratories* M. 376

Samples on physicians' request to The Medical Dept.,

A. WANDER LIMITED
42 Upper Grosvenor Street,
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Standardized to contain in each ounce not less than
2,000 i.u. Vitamin A;
200 i.u. Vitamin D;
0.4 mg. Vitamin B_1;
0.3 mg. Vitamin B_2 (Riboflavin);
4 mg. Niacin (P.P. Vitamin);
3.3 mg. Iron
—in a readily assimilable form.

IF IT'S DELTA
ANYTHING—
—IT'S
Deltacortril*
BRAND OF PREDNISOLONE
DELTACORTRIL is a new synthetic steroid for superior systemic anti-rheumatic, anti-allergic and anti-phlogistic therapy
DELTACORTRIL is 3 to 5 times more potent than hydrocortisone or cortisone and more effective than prednisone
DELTACORTRIL achieves maximal response at fractional dosage
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DELTACORTRIL 1 mg. tablets are supplied in bottles of 100 and 5 mg. scored tablets in bottles of 10, 20, 100, 500 and 1,000
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PFIZER LTD
FOLKESTONE · KENT
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Napkin Rash

PREVENTION and treatment

DRAPOLENE is a cream formulated specifically for the prophylaxis and treatment of urinary dermatitis.

DRAPOLENE CREAM

PRESCRIBE DRAPOLENE BY NAME

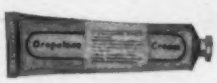
The water miscible property of the cream allows ease of application and facilitates the napkin toilet. The application of DRAPOLENE to both mild and severe forms of urine rash provides a soothing effect which gives relief from the distress associated with all forms of urine rash. Many infant welfare centres confirm that even the severest cases respond satisfactorily in four to six days.

FORMULA

Benzalkonium chloride, 0.01% in a water miscible base.

PACK

2oz. tubes.
1lb. dispensing jars.



CALMIC LIMITED, CREWE. *Phone CREWE 3251-5* **LONDON:** *2 Mansfield St., W.1. Phone LANgham 8038-9*

AUSTRALIA: 458-468 Wattle Street, Ultimo, Sydney, N.S.W **CANADA:** Terminal Building, York St., Toronto.

dispelling the element of doubt

TODAY—with so many antibiotics available—it is always sound practice to specify ACHROMYCIN *by name* whenever true broad-spectrum activity is desired. In this way you are completely assured that the patient receives precisely the treatment you intend. Offered now in no less than fourteen presentations, ACHROMYCIN tetracycline is particularly widely used in capsule form. On every capsule appears the name Lederle—your finest assurance of consistent antibiotic potency and unfailing dependability.

Capsules of 50 mg.—in vials of 25 and 100. Capsules of 250 mg.—in vials of 16 and bottles of 100 and 1000

ACHROMYCIN*

*REGD. TRADE MARK

TETRACYCLINE

Also available in the following forms: Ear Solution · Intramuscular · Intravenous · Ointment 3% · Ointment (Ophthalmic) 1% · Ophthalmic Powder Sterilized · Oral Suspension · Liquid Pediatric Drops SPERSOIDS* Dispersible Powder · Soluble Tablets · Syrup · Tablets · Troches

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Cyanamid OF GREAT BRITAIN LTD., London, W.C.2

WHERE procaine penicillin therapy is necessary, the busy general practitioner can turn with confidence to the 'Avloprocil' range of preparations. Combining high potency with prolonged therapeutic effect, they can be used to advantage in dealing with a wide range of bacterial infections.

THE GENERAL PRACTITIONER

* 'AVLOPROCIL' A.S.	Procaine Penicillin G Aqueous Suspension, 10 c.c. vials.
* 'AVLOPROCIL' DRY	Procaine Penicillin G B.P. Dispersible Powder 0.3, 0.9 and 3.0 m.u. vials.
* 'AVLOPROCIL' N.A.	Procaine Penicillin G and Potassium Penicillin G 0.4 and 4.0 m.u. vials.
* 'AVLOPROCIL'	Procaine Penicillin G Oily Injection with 2% Aluminium Stearate, 10 c.c. vials.

'AVLOPROCIL'

Trade Mark

IMPERIAL CHEMICAL INDUSTRIES LIMITED

PHARMACEUTICALS DIVISION WILMSLOW, CHESHIRE

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12

relieving the agony of spasm

BUSCOPAN is a selective spasmolytic agent which affects specifically the hollow organs of the abdomen and the genito-urinary tract. BUSCOPAN relieves spasm smoothly and quickly without producing unpleasant side effects. Many painful conditions, such as gastric and duodenal ulcer, spastic dysmenorrhœa and renal or biliary colic will respond readily to its action. Its administration often enables accurate differentiation to be made between spasmodic and organic obstruction.

BUSCOPAN*

HYOSCINE-N-BUTYLBROMIDE

Manufactured and distributed in England by Pfizer Ltd., Folkestone, Kent, for

C. H. BOEHRINGER SOHN, INGELHEIM AM RHEIN

Registered proprietors of the Trade Mark

* *Regd. Trade Mark*

Dulcolax

Regd. Trade Mark

(4, 4'-diacetoxy-diphenyl)-(pyridyl-2)-methane

the modern

contact laxative

for oral and

rectal administration

Stirs the sluggish bowel into action.

Safe and reliable.

Tablets promote passage through the colon
Suppositories for prompt evacuation of the lower bowel

Dulcolax enteric coated tablets of 0.005 g. · Bottles of 30 and 200
Dulcolax suppositories of 0.01 g. · Boxes of 6 and 50

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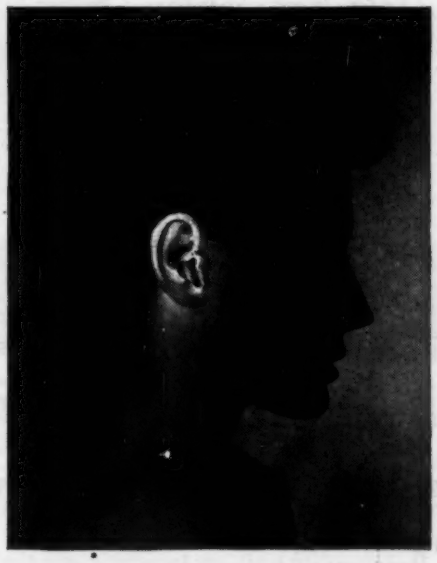
EAR WAX

Removed this easy way



The removal of wax from the external auditory meatus has, in the past, normally entailed attendance by the patient for diagnosis and for the prescription of a suitable loosening agent, and a second attendance a few days later for syringing. Now, by the use of Cerumol Ear Drops, wax can be removed in most cases at one visit. A few drops of Cerumol can be instilled into the ear and, while another patient is being attended to, the soft cerumen dissolves and the harder wax disimpacts. The wax can then be removed by gentle syringing or with cotton wool. The wax may even be found to run out of the ear on its own accord, in which case patients themselves may instil Cerumol at home, obviating further attendances. Cerumol is anti-bacterial, non-irritating and harmless to the lining of the external auditory meatus or the tympanic membrane. Cerumol is included in Category No. 4 of the M.O.H. classified list and may be prescribed on N.H.S. Form E.C.10.

CERUMOL
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EAR DROPS

for the easier removal of wax

Distributors in U.K.
TAMPAX LIMITED, BELVUE ROAD, NORTHOLT, GREENFORD, MIDDLESEX. Telephone : WAXlow 2244

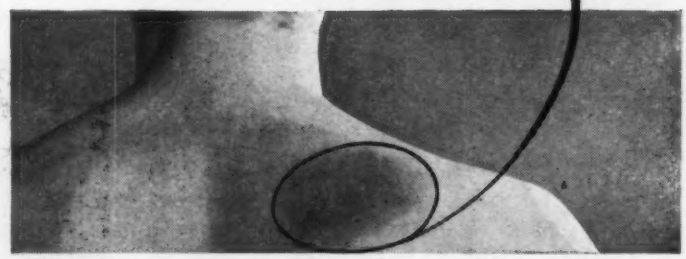
If you wish to test for yourself and have not received recently a 10 c.c. vial please write or telephone direct to :

LABORATORIES FOR APPLIED BIOLOGY LIMITED, 91, AMHURST PARK, LONDON, N.16 Telephone STAmford Hill 2252

PACKS for Surgery Use : 10 c.c. vial — separate dropper included. (Basic N.H.S. price 2/8.) For Hospital Use : 2 oz. and 10 oz. bottles.

Rubriment relieves pain in such conditions as muscular rheumatism, fibrositis, strains and sprains.

Some minutes after application the skin becomes flushed and there is a comforting feeling of warmth which persists for many hours.



RUBRIMENT

A new long-acting rubefacient—safe and effective

Rubriment is a product of original research.

For some years it has been known that some chemicals when applied to the skin produce redness and warmth. Rubriment is based on a new substance, the benzyl ester of nicotinic acid, which has been demonstrated to give a long-lasting rubefacient effect without any damage or irritation to the skin even after prolonged and repeated application.

Ten minutes after application of Rubriment there is a comforting feeling of warmth and the area is seen to be flushed. This redness is due to the dilatation of the small cutaneous blood-vessels. This persists, without danger of irritation to the skin. Clinical reports have been received of the efficacy of Rubriment for the relief of pain in such conditions as muscular rheumatism, lumbago, fibrositis, strains and sprains. The immediate and prolonged vasodilatory action of Rubriment also provides effective relief for unbroken chilblains.

Whenever counter-irritation is indicated, Rubriment is the preparation of choice for the patient.

Available in two forms

Rubriment (2.5% nicotinic acid benzyl ester and 0.1% Capsicin) is available either as a cream or as a liniment, both of which are non-greasy.

The cream is rapidly absorbed and needs only gentle application. *It is supplied in tubes of* 20 *g.* (*Approx.*). *BASIC PRICE to N.H.S.*, 2/2*d.*

The liniment lends itself to massage, if this is required. *It is supplied in bottles of* 2 *fl. ozs.* (*approx.*). *BASIC PRICE to N.H.S.*, 3/-.

Directions for use Apply Rubriment to the affected area. As Rubriment causes a stinging sensation in contact with the eyes and face, the hands should be well washed after use.

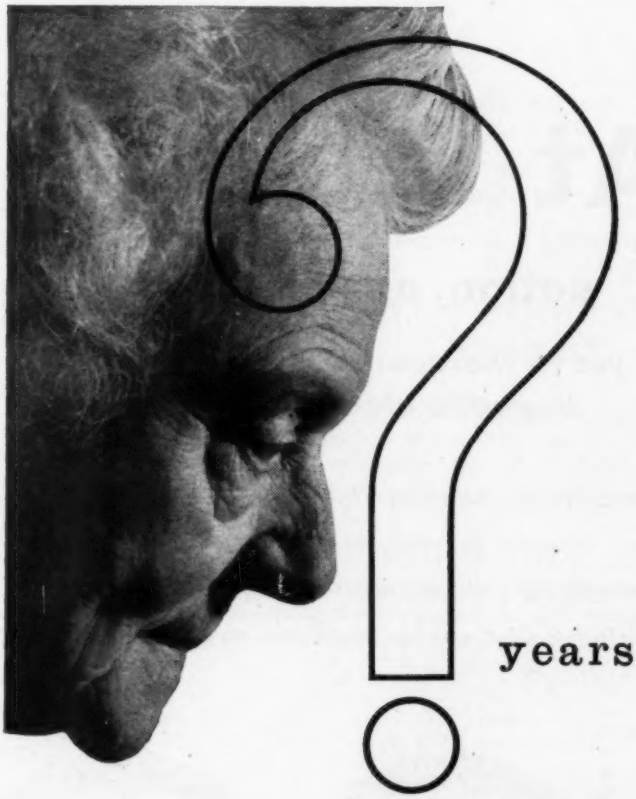
One application per day has been found to be effective for the majority of patients, though a fresh application may be made, if necessary, at more frequent intervals.

Rubriment is not advertised to the public and can be prescribed on form E.C.10.

RUBRIMENT

Horlicks Limited, Pharmaceutical Division, Slough, Buckinghamshire

Arch. Derm., 1951, **192**, 423. Z. ges. inn. Med., 1953, **8**, No. 3, 99. Hautarzt, 1952, **3**, No. 7, 304. Hippokrates, 1950, **14**, 378. Derm. Wschr., 1950, **122**, No. 37. Schweiz. med. Wschr., 1950, **80**, No. 44, 1180. Munch. med. Wschr., 1951, **93**, No. 44, 2209. Ther. Gegenw., 1952, **91**, No. 9, 344. Dtsch. Gesdh. Wes., 1950, **5**, No. 49, 1953. Derm. Wschr., 1951, **123**, No. 7, 145.



? years of discretion?

Wisdom may be said to grow with the years, yet dietary discretion is often sadly lacking in the elderly patient. Indifference to food is reflected in irregular, ill-chosen meals—often leading to impaired nutrition and anaemia states. For just such cases PERIHEMIN Haematinic is an eminently sound prescription. Here, in convenient capsule form, are all the principal haemopoietic substances in therapeutic amounts. PERIHEMIN is therefore valuable for closing the gaps which may exist in the body's anti-anaemia defences.

Perihemin*

Brand of Iron-B_{12}-C-folic acid — stomach-liver fraction-purified intrinsic factor concentrate. In bottles of 100 and 1000

Each capsule contains ferrous sulphate exsiccated, 192 mg. FOLVITE* folic acid, 0.85 mg; vitamin B_{12}, 10 micrograms; ascorbic acid, 50 mg; powdered stomach, 200 mg; insoluble liver fraction, 50 mg; purified intrinsic factor concentrate, 0.5 mg.

*Regd. Trade Mark

Lederle

LEDERLE LABORATORIES DIVISION

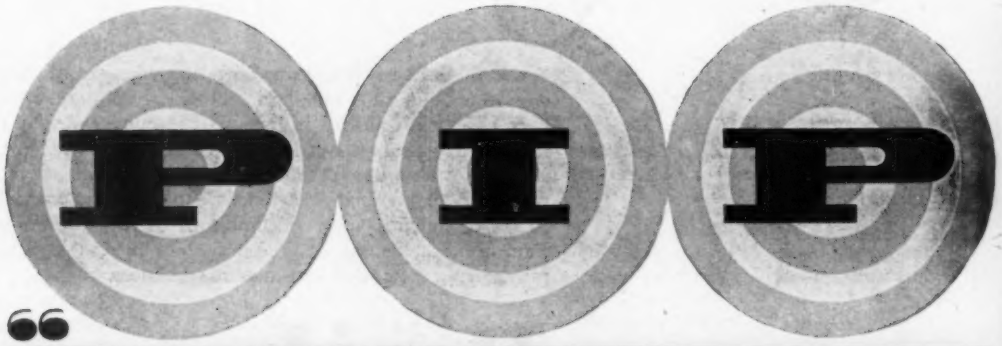
Cyanamid OF GREAT BRITAIN LTD., London, W.C.2

At last

a 'target' action anticholinergic

nearest yet to therapeutic specificity in peptic ulcer

PIPTAL *(N-ethyl-3-piperidyl-benzilate-methobromide) has been shown to be effective in cases not improved by other anticholinergic agents or by belladonna. It has a rapid and prolonged action, affording day and night relief from the pain of peptic ulcer,* and has practically no side reactions.



"potent antisecretory agent"

Piptal is the Trade Mark

- *RELIEVES GASTRIC SPASM*
- *CONTROLS GASTRIC HYPERMOTILITY*
- *CONTROLS HYPERSECRETION*
- *AIDS HEALING OF ULCERS*
- *NO DEVELOPMENT OF TOLERANCE*

"The concept that an anticholinergic drug must produce atropine-like side effects to be effective is not substantiated." [2]

"Piptal is apparently unique in that it represents a potent antisecretory agent without side reactions." [3]

"The drug is well tolerated, having a favourable ratio between therapeutic and toxic effects." [4]

"In all 37 cases . . . there were absolutely no side effects." [1]

"Piptal was the only substance in this study which had no urinary side effects." [5]

"Twenty-five duodenal ulcer cases all reported rapid and thorough relief from pain, with no side effects such as dryness of the mouth, blurring of the vision, or urinary difficulty, all of which have been common complaints after previous use, by these patients, of other anticholinergics." [1]

"No side effects were elicited in any of the patients in the present study and . . . many of the "acute" studies employed four times the usual dosage. Patients taking the medication for the "chronic" studies were totally free of any side effects." [3]

without side reactions

Piptal is the Trade Mark

Administration: One tablet three times a day before meals, and 1 or 2 tablets at bedtime.

Presentation: In bottles of 50 and 500 tablets. 5mg of Piptal in each tablet.

1) *Amer. J. Gastroenterol.*, 1955, 23, 223
2) *Amer. J. Gastroenterol.*, 1955, 24, 601
3) *Amer. J. Dig. Dis.*, 1956, 1, 100
4) *Clin. Soc. Proc.*, 1955, 3, 23
5) *Amer. J. Dig. Dis.*, 1955, 22, 87

BENGER LABORATORIES LIMITED · HOLMES CHAPEL · CHESHIRE

Manufactured under license of Lakeside Laboratories Inc.

pleasant-tasting

Paladac

liquid vitamin supplement

Children take Paladac without fuss or bother because it "tastes good".

Mothers like to give it because Paladac is readily accepted, flows freely, needs no refrigeration, and may be added to milk, fruit juice and other foods, or taken direct from a teaspoon.

Doctors can prescribe Paladac with confidence since it provides a reliable daily source of vitamins—one 4 c.c. teaspoonful supplies 7 vitamins in amounts exceeding minimum daily vitamin requirements.

Primarily intended for the 3-10 age-group, Paladac is equally suitable for adolescents and adults where liquid medication may be preferred.

Paladac is supplied in bottles of 4 and 16 fl. ozs.

Each teaspoonful (4 c.c.) contains:— Vitamin A 5,000 units, Vitamin D 1,000 units, Vitamin B_1 (Aneurine Hydrochloride) 3 mg., Vitamin B_2 (Riboflavin) 3 mg., Vitamin B_6 (Pyridoxine Hydrochloride) 1 mg., Nicotinamide 20 mg., Vitamin C (Ascorbic Acid) 50 mg.

Parke, Davis & COMPANY, LTD. *(Inc. U.S.A.) Hounslow, Middlesex. Tel: Hounslow 2361*

700

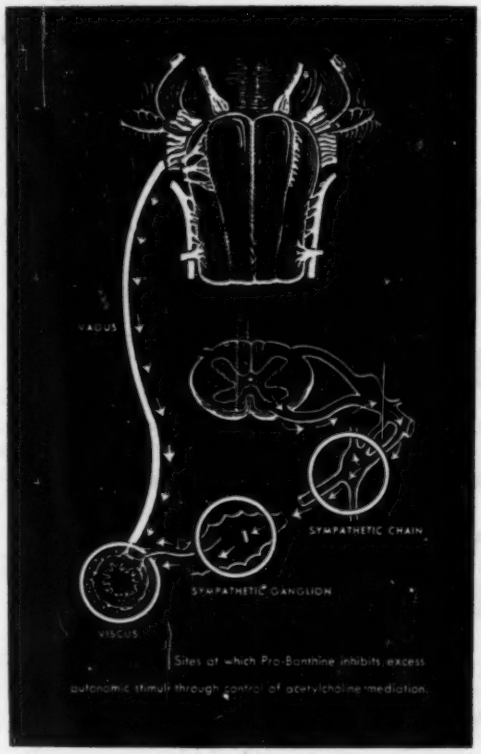
PRO-BANTHĪNE* FOR ANTI-CHOLINERGIC ACTION

A Combined Neuro-Effector and Ganglion Inhibitor

Pro-Banthīne consistently controls gastro-intestinal hypermotility and spasm and the attendant symptoms.*

Pro-Banthīne is an improved anti-cholinergic compound. Its unique pharmacological properties are a decided advance in the control of the most common symptoms of smooth muscle spasm in all segments of the gastro-intestinal tract.

By controlling excess motility of the gastro-intestinal tract, Pro-Banthīne has found wide use[1] in the treatment of peptic ulcer, functional diarrhoeas, and regional enteritis and ulcerative colitis. It is also valuable in the treatment of pylorospasm and spasm of the sphincter of Oddi.



It was found[2] that Pro-Banthīne orally was an "inhibitor of spontaneous and histamine-stimulated gastric secretion" which "resulted in marked and prolonged inhibition of the motility of the stomach, jejunum and colon . . ."

Therapy with Pro-Banthīne is remarkably free from reactions associated with para-sympathetic inhibition. Dryness of the mouth and blurred vision are less severe with Pro-Banthīne than with certain other potent anti-cholinergic agents.

In the above series[2], "Side effects were entirely absent in single doses of 30 or 40 mg. . . ."

Pro-Banthīne Bromide (2′-diisopropylamino-ethyl xanthene-9-carboxylate methobromide) brand of propantheline bromide, is available in sugar-coated tablets of 15 mg.

For the average patient one tablet of Pro-Banthīne (15 mg.) with each meal and two tablets (30 mg.) at bedtime will be adequate. Full literature is available on request. G. D. Searle & Co. Ltd., High Wycombe, Bucks. Tel. High Wycombe 1770.

* *Registered Trade Mark.*

[1] Gastroenterology (1953) 25 : 416.
[2] Gastroenterology (1953) 25 : 24.

SEARLE

P.B. P96

The original Lente Insulins

NOVO

Novo Lente Insulin

Novo Semilente Insulin

Novo Ultralente Insulin

All available in 40 and 80 units per ml.

EVANS MEDICAL

EVANS MEDICAL SUPPLIES LTD.

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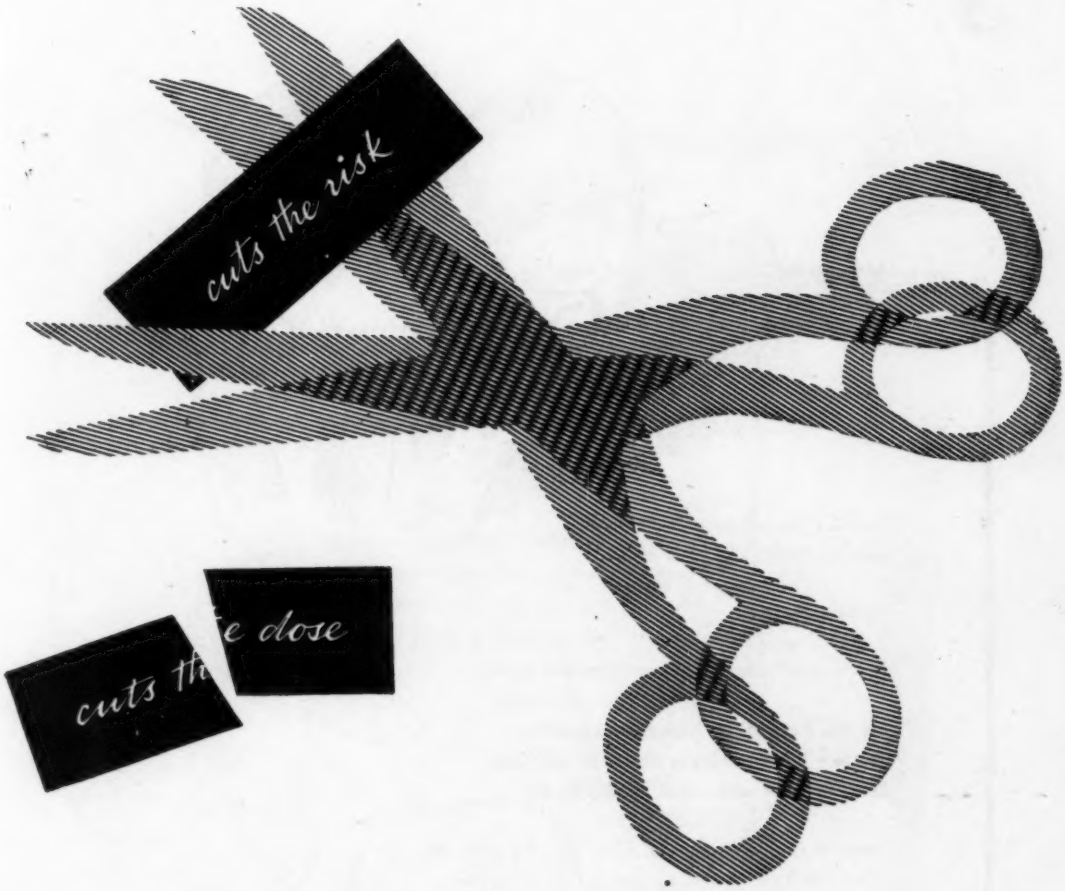
London Office: Ruislip, Middlesex (Ruislip 3333)



Now Yours to Prescribe

CORDEX*

Prednisolone + Acetylsalicylic Acid

* trademark

for the mild to moderate
rheumatic conditions encountered in general practice

Upjohn

Upjohn of England Ltd · 4 Aldford Street · London W1

"How did you get on with that new salicylate cream I told you about?"

"You mean Algesal?"

"Yes — local salicylate by inunction and all that"

"Very well. Matter of fact, I was meaning to tell you about it — it is extraordinarily effective for soft tissue rheumatism and it works without irritating the skin."

"Seems to bear out what that fellow said the other day at the Medico-Chi meeting, that the site of action of the salicylates in the rheumatic syndromes may be peripheral, at tissue level."

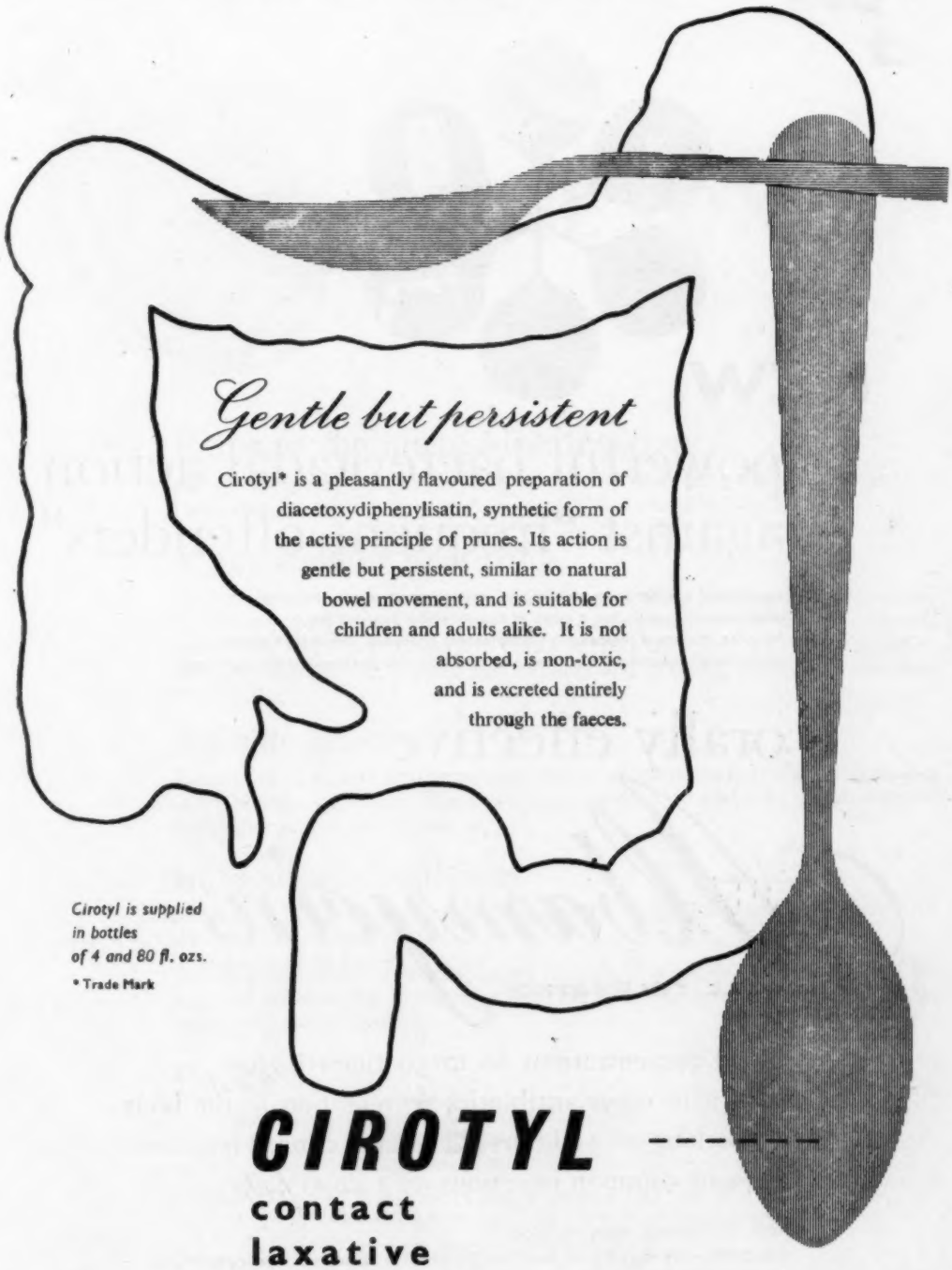
Algesal

10% diethylamine salicylate in a soothing vanishing cream

non-irritant, skin penetrating salicylate for the relief of rheumatic pain by inunction

Full literature and samples gladly sent on request to the manufacturers:

E.G.H. LABORATORIES LTD, PERU STREET, SALFORD 3, LANCS.



Gentle but persistent

Cirotyl* is a pleasantly flavoured preparation of diacetoxydiphenylisatin, synthetic form of the active principle of prunes. Its action is gentle but persistent, similar to natural bowel movement, and is suitable for children and adults alike. It is not absorbed, is non-toxic, and is excreted entirely through the faeces.

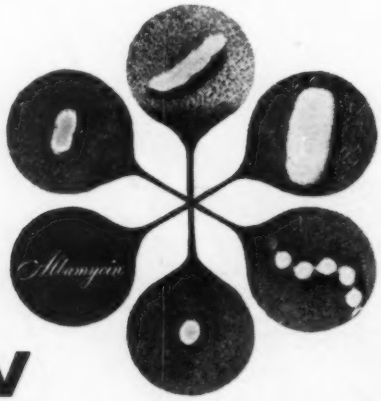
Cirotyl is supplied in bottles of 4 and 80 fl. ozs.

* Trade Mark

CIROTYL

contact laxative preparation

PARKE, DAVIS & COMPANY LTD. *(Inc. U.S.A.)* HOUNSLOW • MIDDLESEX • TEL: HOUnslow 2361 720



NEW

powerful bactericidal action against "frequent offenders"

Bactericidal against gram-positive and certain important gram-negative organisms, Albamycin has a range of activity which includes the following "frequent offenders": staphylococci (including "resistant" strains), streptococci, pneumococci, proteus and certain strains of pseudomonas organisms.

orally effective

*Albamycin**

(brand of novobiocin)

WELL TOLERATED

blood concentrations 10 to 50 times higher than with other antibiotics + retention in the body for as long as 24 hours = prompt clinical response in many common infections *on 2 doses daily*

ADULTS — *500 mg. every 12 hours.*
CHILDREN — *15 mg./Kg. of body weight per day, usually in two equal doses.*
SUPPLIED *250 mg. tablets, bottles of 16 and 100.*

* trademark

Upjohn UPJOHN OF ENGLAND LTD • 4 ALDFORD STREET • LONDON W1

ADRENOXYL

Reduces the mean bleeding-time

Adrenoxyl reduces the mean bleeding-time by decreasing the permeability and increasing the contractility and resistance of the capillary wall.

A dry field at operation

Adrenoxyl has been successful in diminishing capillary bleeding in a wide range of surgical operations. It has proved particularly useful in ear, nose and throat, ophthalmic and plastic surgery. In plastic surgery of the face it has been reported that, post-operatively, there is less swelling and bruising when Adrenoxyl has been used.

No side effects

Adrenoxyl does not have any side effects or contraindications. It does not affect blood coagulation, blood pressure or pulse rate and does not possess any sympathomimetic properties.

In medical conditions

Adrenoxyl has been used with success in those medical conditions associated with capillary fragility.

In the British Medical Journal (April 21st, 1956) a correspondent confirmed the value of Adrenoxyl in providing a dry field for the surgeon and in shortening the duration of the operation.

Packs

Ampoules: Boxes of 6 and boxes of 50.
Each ampoule contains 0.75 mg. of adrenochrome monosemicarbazone dihydrate.

Tablets: Tubes of 25 and bottles of 500.
Each tablet contains 2.5 mg. of adrenochrome monosemicarbazone dihydrate.

The best results are obtained when both tablets and ampoules are used.

HORLICKS LIMITED

Pharmaceutical Division Slough Bucks

Literature and samples are available on request to the Medical Information Dept.

27

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The interesting case of

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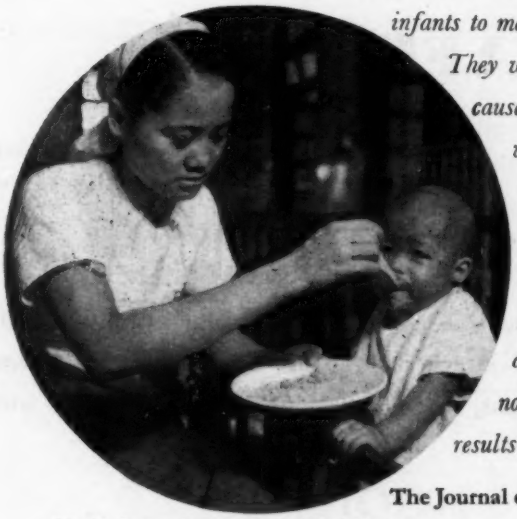
The Journal of Tropical Paediatrics, 1955. Volume 1 Page 47.



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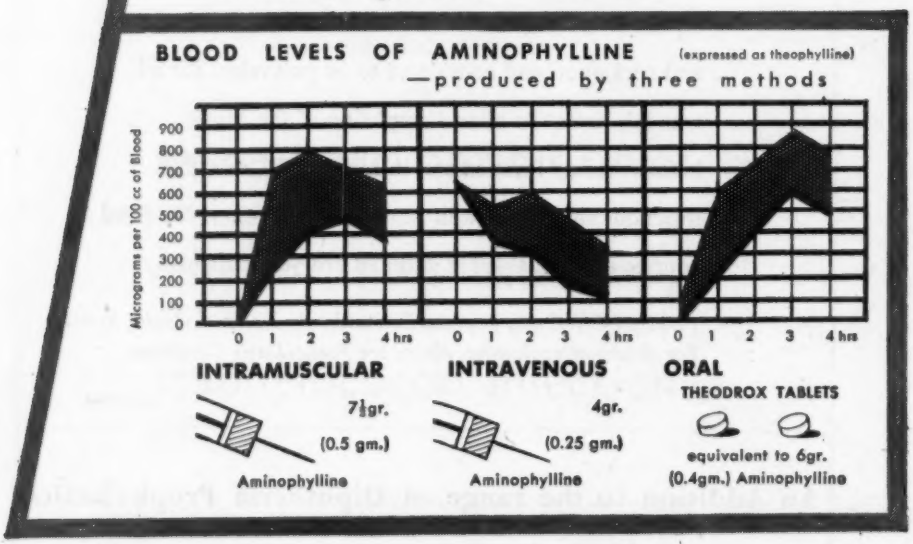

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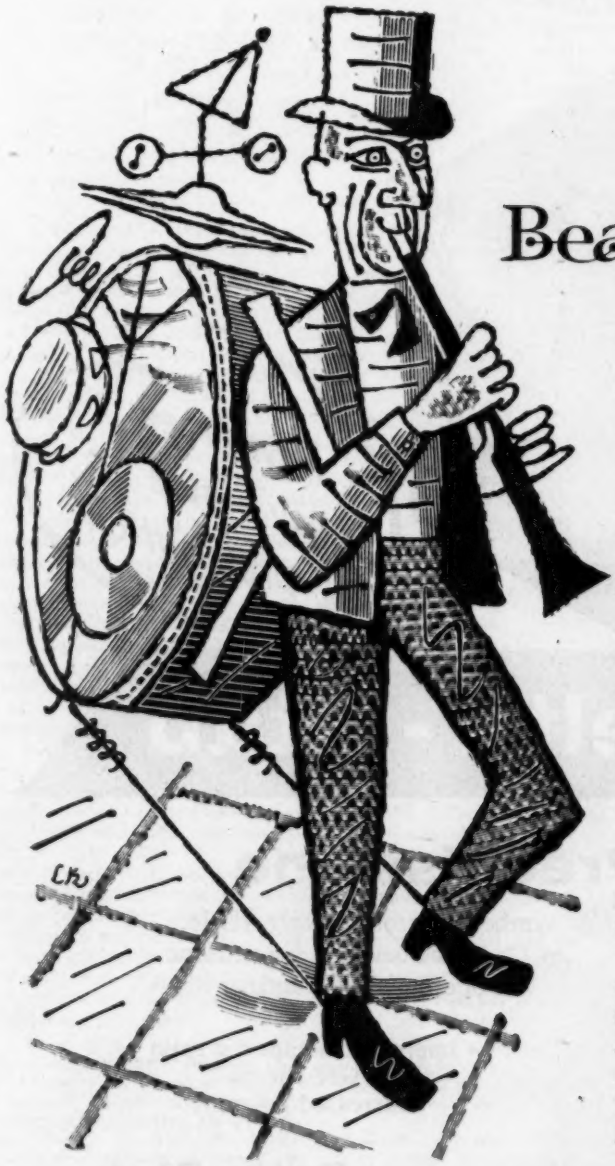

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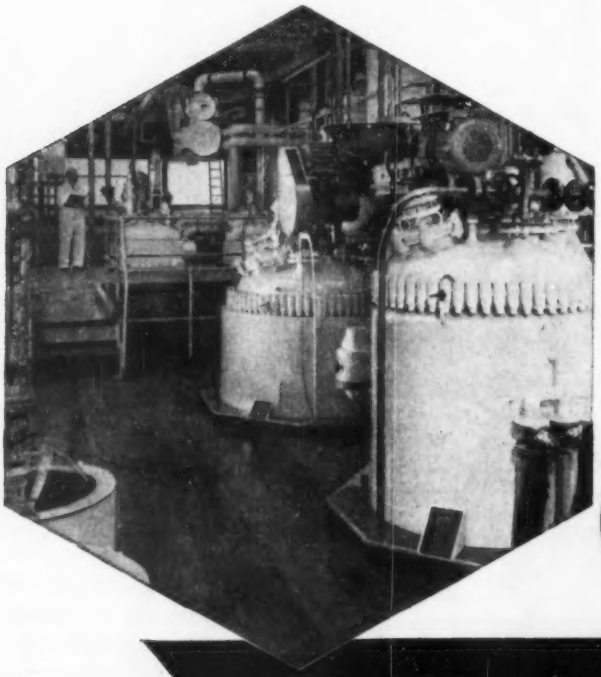

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INDIVIDUAL VARIATIONS IN EXPENDITURE OF ENERGY

J. BOOYENS *
M.Sc. Potchefstroom

R. A. MCCANCE
C.B.E., M.D., Ph.D. Camb., F.R.C.P., F.R.S.
PROFESSOR OF EXPERIMENTAL MEDICINE IN THE UNIVERSITY OF CAMBRIDGE

IT has generally been accepted that variations in individual calorie intakes are due to differences in age, size, and muscular activity at work and recreation, tempered to some extent by the degree of efficiency and training (Orr and Leitch 1938, Passmore and Durnin 1955, Mayer 1956a and b). It has also been shown, however, by Widdowson (1936), Widdowson and McCance (1936), and Widdowson (1947) that, in any homogeneous group of adults or children, there are always some individuals who have calorie intakes greatly in excess of those of others, and that the differences cannot necessarily be explained by size or obvious muscular activity. Edholm et al. (1955) took these observations a stage further when they found that cadets who appeared very similar outwardly sometimes expended surprisingly different amounts of energy in lying, sitting, and standing. The records for the first of these occupations were made after the cadets had been recumbent for ten minutes. The men were not, therefore, in a strictly basal state, and some of the individual differences may have been due to this. Similar differences were found during sitting and standing, but this is much easier to explain, for these occupations allow much more latitude, and some people are always more "restless" than others whether they sit or stand.

It has been shown by Wiehl (1944) that schoolboys spend most of the twenty-four hours lying or sitting. This has also been found to be true for factory workers (Bransby 1954), cadets (Widdowson et al. 1954, Edholm et al. 1955), and mine workers and clerks (Garry et al. 1955).

In the light of these findings Edholm et al. (1955) suggested that differences in the energy expended during lying and sitting might be responsible for large individual variations in calorie intake. It has subsequently been felt that similar differences might underlie the facility with which some people appear to put on weight, whereas others find it difficult to do so. We therefore decided on the following programme:

(1) To check over the findings of Edholm et al. (1955) and to demonstrate again, if possible, that, in a group of healthy and outwardly homogeneous people, there are usually some who expend considerably less energy in lying, sitting, and standing than do others.

(2) To study in detail the calorie expenditure of some people who utilise large or small amounts of energy when they are lying, sitting, and standing and to find out to what extent their calorie intake and body build may be influenced by this.

(3) To single out other matters which influence individual energy requirements and, if possible, to find out the cause.

Experimental Arrangements

General plan.—A trial investigation was first made in which the expenditure of energy by healthy people was measured while they were lying, sitting, and standing under comparable experimental conditions. A few people whose expenditure of energy fell at the extremes of the normal range were then selected to determine and compare their total turnover of energy.

Material.—Fourteen females and twenty-two males volunteered for the trial investigation. Information about their age, height, weight, and surface area is given in table I. Apart from a few science students, all the people were attached to the Department of Experimental Medicine and were accustomed to the idea of experimental work; hence psychological influences on that score were eliminated as far as possible.

Standardised Procedure

All metabolic measurements were made towards the latter part of the morning or of the afternoon, about four hours after the previous meal. The people first lay down for thirty minutes, and their pulse-rate was used to indicate when their metabolism had reached a steady state (Collett and Liljestrand 1924, Karrasch and Müller 1951).

All measurements were made in the same room, in which the temperature was about 20°C. A comfortable bed and an upright chair were available on which the subject lay and sat; and, while measurements were being made, only the subject and the observer were in the room.

In the preliminary survey the sequence of events was always the same:

During the first thirty minutes of recumbency three ten-minute samples of expired air were collected and the pulse-

TABLE I—ENERGY EXPENDED IN LYING, SITTING, AND STANDING

Subject no.	Age (yr.)	Height (cm.)	Weight (kg.)	Surface area (sq. m.) Du Bois (1927)	Expenditure of calories (per sq. m. per hr.)					
					Lying		Sitting		Standing	
					Lowest of 4 readings	% of average for group	Expenditure	% of average for group	Expenditure	% of average for group
Males:										
1	23	180·0	81·0	2·01	37·1	98·7	42·7	101·6	44·8	96·8
2	41	180·0	69·5	1·88	37·3	99·2	40·2	95·8	47·5	102·6
3	25	178·0	67·2	1·84	37·5	99·9	38·5	91·8	42·7	92·2
4	**24**	**183·0**	**78·0**	**2·00**	**48·0**	**127·6**	**53·7**	**126·8**	**58·5**	**126·2**
5	26	185·5	78·6	2·02	44·5	118·3	47·2	112·4	62·0	133·6
6	26	180·0	77·3	1·96	39·7	105·5	41·3	98·4	46·8	101·0
7	**31**	**172·0**	**52·7**	**1·62**	**26·7**	**71·0**	**28·9**	**69·4**	**31·0**	**67·4**
J. B.	**24**	**185·0**	**86·8**	**2·11**	**32·2**	**85·6**	**42·6**	**101·4**	**54·0**	**116·6**
8	29	171·5	63·2	1·74	43·1	114·6	46·8	111·6	43·8	94·6
9	26	175·0	72·3	1·87	37·2	98·8	52·9	126·0	55·1	118·8
10	23	185·0	73·1	1·95	44·6	118·4	52·6	125·2	57·2	123·6
11	21	180·0	60·9	1·78	39·7	105·6	40·1	95·8	45·5	98·3
12	32	171·0	54·5	1·63	41·9	111·0	41·9	99·8	43·4	93·8
13	23	180·5	72·3	1·90	32·2	86·1	39·8	95·0	45·7	98·6
14	22	187·0	75·9	2·03	44·9	119·2	44·3	105·4	54·9	118·4
15	41	177·5	70·0	1·87	32·1	85·6	32·2	77·0	..	..
16	21	190·0	78·6	2·04	35·3	94·6	38·2	91·0	39·1	84·4
17	21	185·0	69·5	1·91	38·0	101·0	47·4	112·9	45·2	97·6
18	21	168·0	61·8	1·70	36·3	97·2	39·5	94·2	43·4	93·8
19	20	177·0	73·1	1·89	36·2	96·8	40·3	96·0	40·4	87·2
20	21	176·5	70·9	1·87	39·2	104·1	46·5	110·8	42·7	92·2
R. M.	**57**	**179·0**	**52·3**	**1·66**	**24·3**	**64·6**	**27·5**	**65·5**	**29·0**	**62·5**
Average	27·3	179·3	69·9	1·88	37·6	..	42·0	..	46·4	..
S. D.	..	..	..	..	5·92	..	6·93	..	7·25	..
Females:										
21	26	160·0	68·6	1·72	32·8	91·6	38·7	92·4	43·9	94·4
22	18	172·0	61·3	1·72	38·3	106·9	45·3	108·1	50·9	109·4
23	27	168·5	56·8	1·64	40·6	113·4	43·9	104·8	46·1	99·1
24	29	161·0	80·9	1·85	29·8	83·2	43·1	102·9	50·6	108·8
25	31	160·5	60·5	1·63	33·9	94·6	32·9	90·5	41·2	88·6
26	20	164·0	51·3	1·54	34·4	96·1	37·7	90·0	38·9	83·7
27	22	159·0	51·3	1·51	36·9	103·1	38·1	90·9	41·7	89·7
28	17	157·5	45·0	1·43	40·7	113·7	49·5	118·1	49·9	107·3
29	**37**	**160·0**	**54·3**	**1·56**	**39·8**	**111·1**	**47·3**	**112·9**	**51·9**	**111·6**
30	24	160·0	52·7	1·54	34·1	95·2	42·8	102·2	40·5	87·1
31	41	152·0	60·4	1·57	36·7	102·5	44·7	106·7	54·3	116·8
32	22	157·5	66·3	1·78	37·0	103·3	44·8	106·9	65·7	141·2
33	21	167·5	57·7	1·65	39·2	109·5	45·8	109·5	44·7	96·1
34	**37**	**164·0**	**61·8**	**1·68**	**24·7**	**69·0**	**27·5**	**67·2**	**31·8**	**68·4**
Average	28·0	161·7	59·2	1·63	35·6	..	41·6	..	46·6	..
S. D.	..	..	..	..	4·64	..	5·48	..	7·07	..

* Supported by financial grants from the Transvaal and Orange Free State Chamber of Mines and the South African Council for Scientific and Industrial Research.

rate was measured at five-minute intervals. After this thirty-minute period a fourth ten-minute sample of expired air was collected. The subject then sat up on the chair for five minutes, after which a ten-minute sample of expired air was collected. The subject next stood for five minutes, and again a ten-minute sample of expired air was collected. The subjects were asked to stand as they would normally stand, that is, at ease.

Expired air was collected with Douglas bags and a conventional mouth-piece and valve-holder (Douglas and Priestley 1948). Volumes of expired air were measured with a standard calibrated dry gas-meter, and samples of expired air were kept in rubber containers for analysis but never for more than an hour, to minimise the loss of carbon dioxide from the samples (Orsini and Passmore 1951).

Expired air was analysed with the automatic Hartmann and Braun (1956) analyser, and the accuracy of the analysis made with this apparatus was checked against duplicate analysis of the same samples of expired air on the Haldane apparatus (Haldane and Graham 1935) during the early stages of this investigation. Differences in carbon-dioxide content and oxygen deficit in samples of expired air given by the two methods never exceeded 0·09% and were mostly within a 0·05% range of agreement. Calorie output was calculated from the non-protein respiratory quotient and the calorie-liberation tables of Cathcart and Cuthbertson (1931).

Six people were selected from the preliminary survey for detailed individual studies. These were made as follows:

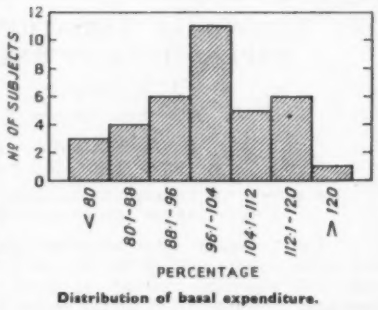
(1) All foods and liquids consumed by each person were weighed separately, and the weights were recorded daily for a week by four of the subjects and for two weeks by two of them. The calorie intakes of each person for each day were calculated from the food tables of McCance and Widdowson (1946).

(2) The subjects kept an exact record of the time spent at each task or occupation on a form similar to that used by Garry et al. (1955), except that the printed sheet used in this investigation covered all the twenty-four hours of the day and not only eighteen of them. By means of the diary sheets the times spent at the various occupations were calculated daily for each person.

(3) Individual expenditures of energy at all, or nearly all, the recorded tasks were measured. Douglas bags were used to collect the expired air at the lighter occupations, and the Kofranyi-Michaelis portable respirometer (Kofranyi and Michaelis 1940, Orsini and Passmore 1951, Müller and Franz 1952) fitted with a standard Siebe Gorman mask during the heavier tasks. The volume recordings of the Kofranyi-Michaelis respirometer were calibrated by passing air through a calibrated dry gas-meter into the Kofranyi-Michaelis respirometer at various flow-rates. At least two estimates of the energy expended at each task were made on all the subjects, and more if it was possible. The energy expended on the quiet occupations—lying, sitting, and standing—was measured in each of these special subjects after fasting for fourteen hours or more and at varying intervals after meals until the post-absorption metabolic level was reached. Figures used in the final computation of the expenditure of energy by the six selected subjects while lying, sitting, and standing are the averages of measurements made from four to fourteen hours after the previous meal. By combining the time spent (minutes) on each occupation with its cost in calories per minute the calories expended at the various occupations daily were calculated, and hence the total daily expenditures.

Results

Table I gives the ages, heights, and weights of the thirty-six people. Those selected for further study are shown in heavy type. The figures for basal metabolic rates (B.M.R.) shown in the table were taken to be the lowest of the measurements of oxygen consumption made in the recumbent position. Usually there was little difference between the last two figures obtained; hence, for all practical purposes, the subjects were down to basal levels at the end of twenty minutes. In many of the subjects there was no fall after the first ten minutes; so the gross adjustments to basal levels evidently took place during this time. The frequency distribution of the basal expenditure of the men and the women is given in the accompanying figure. The men's average weight for height (not given in the table) was 102·5% of the Odier and Mach (1949) standard, and the women's 101·0%. The subjects were, therefore, a fair sample of a European population. Their average B.M.R. was 105·1% (females) and 101·2% (males) of the Robertson and Reid (1952) average. As previously described (Kirk and Kvorning 1946), a few people even in this perfectly normal group had very low B.M.R. Table I also gives the energy expenditure of these subjects sitting and standing and the averages for each of these activities.



Distribution of basal expenditure.

In confirmation of the results of Edholm et al. (1955) some of the subjects differed widely from the group average when they were lying, sitting, and standing. In Edholm et al.'s small series one man had a relatively low metabolic rate while recumbent and a high one while standing, but most men had a consistently low or high metabolic rate at the three occupations. This was true of some of the people who had high B.M.R. in the present study (e.g., subjects 4, 5, 10, 14, 22, 28, and 29), and a similar consistency was found in some of those who had low B.M.R. (e.g., subjects 7, 13, 15, 34, and R. M.); but others who had a normal or a low B.M.R. had a high metabolic rate while sitting or standing, and vice versa (e.g., J. B. and subjects 8, 9, 12, and 24).

Among the men subject 7 and R. M. had exceptionally low expenditures of calories while lying, sitting, and standing, whereas subject 4 had an exceptionally high expenditure. J. B. had a low B.M.R., but his sitting and standing rates were normal and high respectively, and he was selected for further study, not so much because of his exceptional expenditure of calories as because he was of very similar physique to subject 4.

Of the two women selected for further study subject 34 had exceptionally low, and subject 29 exceptionally high, expenditures of calories at the three standard tasks. The B.M.R. of five of these subjects lay well outside the 10% or, at most, 15% limits usually reckoned to be "normal" (Du Bois 1927, Robertson and Reid 1952); and, if the B.M.R. was exceptionally low or high, the expenditure of energy in sitting and standing was of the same type. These variations were not consistently related to age, height, or weight/height ratio of the subjects. This again confirms the findings of Edholm et al. (1955) in some of their subjects (e.g., numbers 5 and 6).

Table II gives the average daily intake and expenditure of calories, with their measures of variability, by each of the six persons selected for detailed study. Most of the diets conformed to the conventional pattern, even to the occasional "old-fashioned" cocktail before supper, but R. M. was eating a diet somewhat peculiar to himself in that it consisted largely of potatoes, legumes, and other vegetables, and had no bread in it, not much meat or animal protein, and very little fat. He ate nearly 1·5 kg. of potatoes a day during the fortnight. The diet provided 95 g. of protein, 45 g. of fat, and 450 g. of carbohydrate daily.

TABLE II—ANALYSIS OF INTAKE AND EXPENDITURE OF ENERGY BY SIX SELECTED PERSONS

Subject no.	Sex	Length of study (days)	Total intake and expenditure of calories (daily average and range)		Percentage of time and energy spent on									
					Lying		Sitting		Standing		Indoor activities		Outdoor activities	
			Intake	Expenditure	Time	Cals.	Time	Cals.	Time	Cals.	Time	Cals.	Time	Cals.
4	M	7	3602 (2294–4142)	3405 (2890–3897)	38·5	25·5	35·7	29·1	5·1	4·6	5·1	4·8	15·6	36·3
7	M	7	2417 (2144–2544)	2212 (1933–2328)	39·0	18·3	22·4	11·4	..	..	25·6	30·7	13·0	39·6
J. B.	M	7	3022 (2740–3289)	2900 (2751–3102)	45·7	26·2	35·5	26·4	..	..	8·9	13·9	9·8	33·5
R. M.	M	14	2432 (2133–3712)	2674 (2183–3183)	31·9	13·4	31·0	13·3	..	..	18·5	19·4	18·6	53·9
29	F	7	2419 (2313–2471)	2458 (2399–2593)	34·8	21·9	23·7	17·1	..	..	34·6	40·6	6·9	20·4
34	F	14	1595 (1063–1883)	1660 (1438–1952)	32·3	20·4	41·9	28·2	7·5	7·0	6·8	19·8	11·5	24·6

The subjects' work did not call for great changes in their expenditure of energy or in their intake from day to day, and there was no clear relationship between them, either immediate or delayed (Edholm et al. 1955). There were, however, considerable differences between the calories expended daily by the individual subjects. No. 7 (male), for example, utilised only 2212 calories a day, and no. 34 (female) 1660, whereas no. 4 (male) required 3405 calories a day, and these average figures for expenditure were always closely matched by the intakes. No. 4 (male) and R. M. weighed themselves carefully before, during, and after their experimental periods, and their weights may be said to have remained the same throughout.

The hours occupied by lying in bed or sitting down were of the now familiar order (Widdowson et al. 1954, Passmore and Durnin 1955). J. B. spent more time than any of the others in bed, and R. M. less, and lying and sitting together account for from 26·7% (R. M.) to 54·6% (no. 4) of the subjects' total expenditure of calories. The time spent lying and sitting ranged from 58·5 to 81·2% of the subjects' total time. No. 4 and no. 34 spent some time standing at outdoor lectures and ward rounds respectively, without other movements, but the others did not.

Indoor activities consisted of shaving, washing and dressing, working in the laboratory, and domestic chores (table III). The outdoor activities consisted of walking, cycling, and recreational pursuits, which varied from digging holes for fence posts to cleaning a car, playing cricket, and cycling. The pattern of these indoor and outdoor activities depended on the subjects' work and interests.

No. 4 was a male student who had no responsibilities in the house and spent much of his time sitting indoors studying. Consequently his activities were mostly outside, getting to and from his work and playing cricket, but together they took up 15·6% of his time and accounted for 1226 calories a day—36% of his total expenditure.

Nos. 29 and 7 both worked in the laboratory but moved actively about it and sat very little. Both of them also had responsibilities at home. No. 29 looked after her cottage and acted as gardener and carpenter. It was she who dug the holes for the fence posts. Consequently her indoor activities occupied 34·6% of her time and utilised about 1000 calories—40·6% of her calorie intake. Her outdoor activities took up less than 7% of her time but required 500 calories—more than 20% of her total.

J. B.'s indoor activities were slight both in time and in the proportion of his calories spent on them. His outdoor activities consisted of cyling about the town. They did not take up much time, but they accounted for 970 of his 2900 calories.

No. 34 spent nearly 50% of her time sitting or standing indoors. Both of these she did with very little expenditure of energy (table 1). Her housework did not take much time although it used up nearly 20% of her calories. Her walking and car-cleaning were considerably less strenuous than J. B.'s cycling, took up little more time, and required only 400 calories a day. Her total turnover of calories was therefore much lower than that of any of the others.

R. M.'s indoor activities occupied a very usual amount of time at a cost of less than those of no. 29 and no. 7, who expended about the same total calories. He took advantage of this experiment, however, to put in as much time as possible on his usual outdoor hobbies and activities, which were cycling and walking, and in the fortnight for which he weighed his food he cycled 692 miles and on the Sundays walked 39 miles over well-made roads in undulating country. These activities took up 18·6% of his time and nearly 54% of his calories—about 1400 a day. Apart from this exercise R. M.'s expenditure of energy would have been little more than 1000 calories a day.

Table III gives the calories utilised by the six selected subjects on various tasks and occupations. The energy expended at each of the recreations was only measured

TABLE III—ENERGY EXPENDED BY SELECTED PERSONS ON VARIOUS TASKS AND OCCUPATIONS

Nature of activity	Energy expended (calories per sq. m. per hr.)					
	Subject 4	Subject 7	J. B.	R. M.	Subject 29	Subject 34
Shaving, washing, dressing, &c...	81	100	81·5	62·5	67	100
Walking	159 (own pace)	196 (3·7 m.p.h.) 225 (4·3 m.p.h.)	195 (3·3 m.p.h.) 239 (4·1 m.p.h.)	138 (3·41 m.p.h.) 168 (3·93 m.p.h.)	138 (3·25 m.p.h.) 205 (4·1 m.p.h.)	151 (4·24 m.p.h.) ..
Cycling	..	171 (in town 8·6 m.p.h.)	232 (in town 10·5 m.p.h.)	134 (in town 8·7 m.p.h.) 221 (in country 12 m.p.h.)	..	..
Household chores, washing up, making tea, making beds, sweeping	..	..	..	..	126	107
Moving about the house, standing talking, occasional stairs, odd jobs	79	..	..	58	..	..
Working in the laboratory (see text)	..	66	91	..	76	..
Recreation and type (see text) ..	201 (cricket)	..	..	..	273 (digging)	101 (cleaning a car)

once. The energy expended on all the other occupations was measured at least twice, and any unexpected finding was confirmed several times. These expenditures were measured to arrive at an over-all figure for the subjects' total utilisation of calories, and some of the occupations were composite ones. The figures for lying, sitting, and standing have already been shown in table I. Figures for the expenditure of energy at various exercises are often given in terms of calories a minute, regardless of the person's height and weight (Edholm et al. 1955, Passmore and Durnin 1955). Here, however, the results have been given as calories per square metre of body-surface per hour because the B.M.R. is usually expressed on this basis, and this was the one used in the construction of table I. They can be converted to calories a minute from the information given there.

Shaving, washing, and dressing.—The expenditure of calories by these subjects in these activities averaged 82 calories per square metre per hour, which is on the low side according to Passmore and Durnin (1955), and one of the figures now presented included having a cold bath and drying afterwards (R. M.).

Walking.—The expenditures in walking ranged from 138 to 239 calories per square metre of body-surface per hour according to the rate and the subject. They are of the order of those given by Passmore and Durnin (1955) in their first figure, but only those for no. 7 and possibly no. 29 lay within the range of scatter shown by the subjects selected for their diagram. Since both the present subjects weighed considerably less than those used for the construction of Passmore and Durnin's figure they both seem to walk with more than the average expenditure of energy. J. B.'s expenditure for his given speed was considerably higher than would have been predicted from the figure. R. M.'s was lower, and those of no. 34 were lower still. There is evidently more individual scatter than the figures given by Passmore and Durnin suggest. Moreover these workers do not mention whether women tend to expend more or less energy than do men on walking.

Cycling.—No. 7's cycling was really a composite activity. It was the journey he made four times daily between his house and the laboratory and included a little walk along a passage about one hundred yards long. J. B.'s expenditure on cycling agrees with the figure given by Edholm et al. (1955) for their fifth subject, but both are on the high side for their speeds when compared with Edholm et al.'s other subjects. J. B.'s expenditure on cycling at 9·4 m.p.h. would probably have agreed quite well with the figure of 7·0 calories a minute given for one of the subjects cited by Passmore and Durnin (1955). R. M.'s expenditure on cycling was much lower than any of the comparable figures cited by Edholm et al. or by Passmore and Durnin—see below.

Working in the laboratory.—For no. 7 this meant standing, using pipettes, attending to a centrifuge, crushing ice, &c. J. B. was emptying Douglas bags and taking pulse-rates, and no. 29 was standing manipulating apparatus on her bench.

Other activities.—No. 4's cricket was net practice and consisted of bowling for a third of the time and fielding for two-thirds. No. 29's recreation was digging holes, and no. 34's cleaning and polishing her car.

Discussion

Basal and Static Occupations

Evidently the present results confirm and extend the conclusions of Edholm et al. (1955) that some people have metabolic rates for basal and relatively motionless occupations which depart much more widely from the average for the group than is usually considered to be the case. In this study some people maintained these unusual rates for months on end, and they must be accepted as part of their permanent, or at any rate, semipermanent characteristics. Since, moreover, adults and indeed children also spend such a large part of the twenty-four hours lying, sitting, and standing, a person with a consistently low rate at all three occupations will require less food to meet these expenditures than does one of similar build with a consistently high rate. The calories expended on these occupations, therefore, are an important reason for variations in the total energy expenditure of individuals. They may be the only important cause in persons who lead outwardly similar lives and must be taken into account no less than the obvious and visible differences in active physical work.

Walking and Active Exercise

These activities were only investigated in the six subjects selected for more detailed investigation, and the individual results have been compared with published ones rather than with the average for their own small group. Except for cadets and soldiers, walking is not a standardised exercise, and no two people use their arms and auxiliary muscles in the same way when they are on the move. Nevertheless the chart given by Passmore and Durnin (1955) indicates only a minor degree of scatter at any given rate. In terms of calories a minute the present subjects had a much wider one.

J. B., for example, walking at 3·9 m.p.h. expended nearly 8 calories a minute, and R. M. only 4·5. This was partly due to large differences in body-weight (Mahadeva et al. 1953), but there is more in it than that. The same differences came out in cycling. R. M. did this exercise with very little expenditure of energy. His sixteen-mile run in the country was taken in three stages on a circular course involving a long hill and a rise of 100–150 feet and a descent against the wind on an exposed road. His expenditure on this run was lower than those of subject 7 or of J. B. cycling more slowly on the level. It is only fair to say that R. M. was riding a light bicycle which had been built to his own specification, but he is both a cyclist and a long-distance walker of great experience and has a highly developed sense of rhythm, and all unnecessary movements were probably eliminated from both occupations twenty-five years ago.

Cause of Variations in Lying, Sitting, and Standing

If we apply these ideas about walking to the expenditure of energy while lying, sitting, and standing we can see why one person may depart so widely from the average. The basal rates probably depend more on the metabolism of the internal organs than do any of the other rates, but there must be a muscular element in them, and the small increases in the expenditures per minute when people sit up and then stand up may be attributed to the small additional amounts of muscular energy needed for these tasks. It is suggested that R. M. and subject 7 can achieve a high degree of muscular relaxation at all three occupations. In keeping with this is the fact that R. M.'s pulse-rate is only 42–45 under basal conditions. Subjects 4 and 29 never achieved even the average degree of relaxation and were always far above it; and J. B., who had a basal rate well below the average when he was lying down and was evidently able to relax more than the average person in that position, expended just the average amount of energy while sitting, and his expenditures while standing, walking, and cycling were prolific. This was due to tension, minor "unnecessary" movements, and lack of "rhythm."

Expenditure of Energy and Body-weight

Fat men and, still more, fat women have often longed for some excuse for their obesity, and physicians have supported them in their search for some minor departure from the metabolic norm which would explain their tendency to put on weight. It was thought at the outset of this study that if persons were found with exceptionally low metabolic rates lying, sitting, and standing they might all tend to be fat and have trouble in keeping their weight within normal bounds. Subject 34 and J. B. have this trouble, but R. M. and subject 7 are both exceptionally thin and do not have to worry about the food they eat in spite of their low metabolic rates. Subject 4, who has a very high metabolic rate while lying, sitting, and standing, is a big man and maintains his weight quite easily, and subject 29 is a woman of normal proportions.

These masked variations in expenditure of energy explain well enough why some people require few calories

to maintain their weight and others twice as many, but there is nothing to suggest that they play any part in the fundamental control of appetite. This is a problem which remains to be solved, although some of the recent work on the peripheral and central mechanisms have been most illuminating (Kennedy 1951, Janowitz and Hollander 1955, Brobeck 1955, 1956, Mayer 1955, 1956a and b). In modern life, however, the food served for the "society" in which we live and the food eaten by habit and convention in it are adjusted unconsciously to suit the person who is average in all respects. Persons with low expenditures of energy, whether obvious or masked, can only maintain or retain a strictly average weight if they stop eating the strictly conventional amounts of food provided for their "society."

Clinical Relationships

The intensive search for new syndromes and for opportunities to apply new remedies has led Freedberg et al. (1955), Kurland et al. (1955), and Tittle (1956) to describe a condition characterised by a low basal metabolic rate with one or more of the following symptoms but no other signs of myxœdema or subnormal function of the thyroid gland: "lethargy, easy fatigability, nervousness, irritability, emotional instability, sensitivity to cold, headache, ill defined skeletal pain, diminished sexual potency in the male and menstrual irregularity in the female." It is claimed that these persons will respond to triiodothyronine but not to thyroid extracts or to thyroxine. If this becomes public knowledge, there is a risk (*Lancet* 1956) that many who come to general practitioners with a vague story covered by these equally vague symptoms will be given triiodothyronine. *The Lancet* goes on to say that the use of triiodothyronine for this purpose is unjustifiable and should be discouraged. With this statement we agree and add that very low B.M.R. in apparently normal and healthy persons have been well described in the past (Thompson and Thompson 1928, Lee 1935, Kirk and Kvorning 1946). It has still to be proved that a B.M.R. 30–35% below the average for the group is necessarily abnormal. Our experience and that of others (Means and Lerman 1935, Means 1937) suggest that it is not.

Summary

The metabolic rates of thirty-six healthy men and women were estimated while they were (1) in the basal state, (2) sitting on a comfortable upright chair, and (3) standing. Three had rates more than 30% below, and one a rate of more than 24% above, the average for the group for all three occupations.

The energy balance-sheets of these four and of two other persons were investigated for seven or fourteen days. The intake was measured by weighing the food, and the output by a time and motion study combined with measurements at the important occupations.

It was concluded that (1) the limits usually accepted for the normal basal rates are too narrow; and (2) an unusual rate for lying, sitting, and standing may make a great difference to the total daily expenditure; but (3) although a small expenditure at these three occupations may lead to a small energy requirement it does not necessarily lead to obesity or even to a tendency to put on weight.

Our acknowledgments go to the subjects for their willing coöperation, and to Dr. E. M. Widdowson for suggesting the investigation.

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NEONATAL COLD INJURY
DUE TO ACCIDENTAL EXPOSURE TO COLD

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EVERY winter brings in its train a number of infant deaths due to accidental exposure to cold. In the past three years 14 babies thus exposed have been treated in Brighton, and no less than 8 of them have died. If these figures are typical of the country as a whole, the yearly number of deaths from this cause may exceed a hundred.

The disorder finds no place in the Registrar-General's Statistical Review, because it goes unrecognised and is hidden under various other diagnoses, of which the two commonest are hæmorrhagic pneumonia and sclerema neonatorum.

When this disorder was previously described (Mann 1955) it was thought that no earlier description of it had appeared. However, as Everley Jones (1955) pointed out, the account of "œdema of the newborn" given by Henoch in 1889 corresponds fairly closely to the condition that we have observed; and cold, along with bad air and wretched nourishment, was then recognised as an ætiological factor. Three further accounts of the disorder, each emphasising the part played by chilling, have since been found in Dutch medical literature (Munk 1937, Campagne 1941, Veldkamp 1946); and a fourth, from Palestine, entitled Cold Injury in a Subtropical Climate (Nassau 1948), suggests a suitable name for the condition. We make a plea for its adoption in the hope that it will encourage recognition of the disorder in this country and elsewhere.

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Clinical and Pathological Picture

Presenting Features

A composite picture of the disturbance may be sketched roughly as follows. The baby makes satisfactory initial progress after a normal birth in the home, the pregnancy having been uneventful. Although the birth-weight is often below the average full-term figure, prematurity is certainly not a constant feature.

In the first week or two of life, sometimes later, increasing apathy appears, and causes concern when the infant first takes insufficient milk and shortly afterwards refuses its feeds completely. As part of the general sluggishness, the cry becomes feeble and may be described as a whimper or a whine. Coldness of the body to touch and swelling of the extremities or other parts, such as the eyelids, may be observed; but surprisingly both are often overlooked by the parents, and even by the attending doctor or nurse. Other less constant presenting features may be related to a hæmorrhagic tendency or to impaired kidney function; thus blood may be vomited or passed per rectum, or decreasing amounts of urine may be voided until micturition ceases altogether.

On detailed examination the body-temperature, recorded in the rectum with a low-reading thermometer, is nearly always well below 90°F. Although apparently conscious, the child lies motionless. The facial expression is serene and does not suggest ill health. There is an aura of coldness about the body, immediately apparent when the examining hand is placed under the clothes or cot coverings. The skin, especially over peripheral parts, feels remarkably cold and corpse-like. The face, hands, and feet are often strikingly red, with a particularly high colour of the eyebrows, cheeks, nose-tip, and chin. At times the erythematous areas have a cyanotic tinge, often shared by the lips. In contra-distinction, generalised skin pallor may occasionally be found, but despite this the infant may still not appear ill. Pitting œdema of at least the extremities is usual, and on careful scrutiny may be found to be more extensive than is at first apparent. Local hardening of the superficial tissues over frankly œdematous parts, most usually the legs, is common at some stage of the illness and may not appear until rewarming is in progress; generally speaking this sign indicates a poor prognosis. The illness is commonly complicated by some infection, characteristically rhinitis with profuse nasal discharge. Although most physiological processes appear depressed by the hypothermia, the heart-rate is often comparatively rapid when the patient is first seen.

Clinical Course

In the majority of cases (13 out of 14) rewarming was passive, or "slow" as it is more commonly called. This involves mitigating heat-loss, the baby warming up largely by its own metabolic efforts. The time taken for the temperature to return to normal levels under these conditions varies widely, and we could find little or no correlation between the rate of increase in temperature and subsequent survival or death. In 1 case active ("rapid") rewarming was tried; but although the temperature was raised satisfactorily, and at first without apparent ill effect, the child died 32 hours later.

The scope of investigation of recent cases is indicated in the account of case 2 (see below). The only important biochemical abnormality we have found is lowering of the blood-sugar level, which may at times be profound. Determinations before treatment were made in 6 cases only; in 2 the level was 10 mg. per 100 ml. or less; the remaining levels were 37 mg., 46 mg., 55 mg., and 94 mg. per 100 ml. The baby showing the highest of these levels subsequently gave values of 65 mg. (second day) and 57 mg. per 100 ml. (fourth day).

The hæmatocrit was studied in 3 infants. Although the figures tended to be high, only in case 2 were they above the normal range for the healthy newborn.

The complications have chiefly been infective, ranging from rhinitis and ophthalmia, which were fairly common, to pneumonia (2 cases) and otitis media (3 cases, found at necropsy). Hæmorrhagic manifestations included petechiæ, vomiting of altered blood, melæna, and, perhaps in a separate category, pre-agonal bleeding from the mouth and nose.

In 3 cases generalised epileptiform fits occurred which in 1 baby at least, were related to hypoglycæmia. Fits are not necessarily a sign of serious import; 2 of the affected infants survived, while the 3rd died from a fulminating infection due to *Hæmophilus influenzæ*.

The duration of survival of fatal cases ranged from 7 to 100 hours with a mean of about 40 hours. The manner of deterioration was similar in all. The baby began to look ill; erythematous areas became dusky; in several infants facial pallor was a notable terminal feature. Death in all cases appeared to be due to respiratory failure. In 3, terminal straining occurred during which the face flushed and shortly afterwards sanguineous frothy material poured out of the upper respiratory passages.

Necropsy Findings

Necropsies were performed on all fatal cases. In 5 of the 8 examined, the dominant finding was massive pulmonary hæmorrhage. At first this was called "hæmorrhagic pneumonia," but the consistent absence of pathogenic bacteria on culture (and of influenza virus in the 1 case in which tissue was sent to the Virus Reference Laboratory), together with the lack of any histological evidence of inflammatory reaction in the lungs, compelled revision of this diagnosis. True hæmorrhagic pneumonia was present in one case, already mentioned, which showed massive *H. influenzæ* infection, but the abundant pus in bronchioles and bronchi gave a picture which even in the gross could be recognised as quite different.

Hæmorrhage in other tissues was not a conspicuous feature. In 2 cases there were skin petechiæ, but these were scanty and slight. 3 cases showed acute gastric erosions with a small amount of bloodstained mucus in the stomach; and in 2 cases hæmorrhages were found beneath the serosal surface of the colon. The findings did not suggest, in any of the cases, that the pulmonary hæmorrhage was an expression of a generalised hæmorrhagic tendency.

Œdema of the extremities and deep coloration of the skin has already been mentioned. A small amount of ascites (5–15 ml.) was constantly present. These changes, with occasional evidence of rhinitis or otitis, constituted the only other abnormal necropsy findings. Clearly infection does not play a dominant rôle. Massive pulmonary hæmorrhage, since it occurs in several other conditions and was not always present in our series, can hardly be regarded as pathognomonic; but if it is found in association with mild ascites and œdema and cyanosis of the extremities, cold injury should be suspected.

Illustrative Case-records

Mild Case with Recovery

Case 1.—A baby, aged 6 days, birth-weight 7 lb. 8 oz., was admitted to the Royal Alexandra Hospital on Jan. 30, 1954, with swelling of the hands and feet which had developed over the previous two days. He had been born on a cold, snowy day (minimum air-temperature 31°F) a few hours after his parents had moved into a new prefabricated house. The only heating in the bedroom was by a small electric fire, but when bathed after birth (and daily thereafter) he was taken into the warmer front room.

On examination temperature 86°F (see fig. 1), heart-rate 142, respirations 36 per min. The face and extremities were bright pink and there was pitting œdema of the hands, legs, and feet. There was no cyanosis and no hardening of the skin or subcutaneous tissues. The chest was clinically clear.

Treatment and progress.—The child was nursed in a cot at room-temperature (about 70°F). Expressed breast-milk was

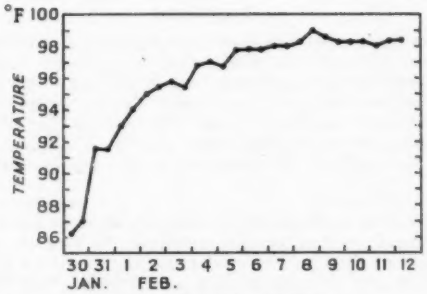

Fig. 1—Body-temperature in case 1.

given by bottle, and aureomycin 25 mg. orally every four hours for ten days. The body-temperature was 91°F on the day after admission and gradually rose to normal in nine days; the œdema slowly subsided over the same period. No oliguria was recorded. A slight eye discharge was noted on the second day in hospital but lasted less than twenty-four hours. After fourteen days the infant was discharged well, being fully breast-fed. When seen sixteen months later he was a normal, healthy child.

Severe Case with Recovery

Case 2.—This baby, aged 12 hours, birth-weight 6 lb. 1 oz., was admitted to the Royal Alexandra Hospital on Feb. 8, 1956. The birth took place in a new council house, not yet fully dried out, in a bedroom heated by one electric fire, on a cold day (minimum air-temperature 34°F). Delivery, at term, was complicated by a knot in the cord and meconium-stained liquor; breathing was established with some difficulty. The infant was bathed in front of the fire, at 10.30 P.M., and placed in a carry-cot with one hot-water bottle, which was not changed. At 1 A.M. (contrary to instructions) the fire was switched off; the baby cried all night. The cot-temperature on the afternoon of admission, after the fire had been on all day, was only 53°F.

On examination he was a normal-looking infant with an active lusty cry; there was cyanosis of the skin and a marked aura of coldness: rectal temperature 81°F, heart-rate 120. No œdema was present; the chest was clear. Slight stickiness of one eye was noted.

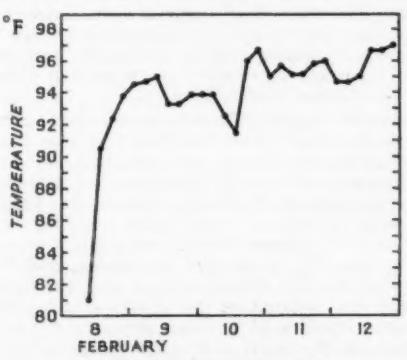

Fig. 2—Body-temperature in case 2.

Investigations (before rewarming).—Hæmatocrit 59%, hæmoglobin 16·4 g. per 100 ml., blood-sugar less than 10 mg. per 100 ml.; serum-proteins 4·5 g. per 100 ml., blood-urea 30 mg. per 100 ml., serum-potassium 4·36 m.eq. per litre, serum-chloride 96·4 m.eq. per litre, serum-bicarbonate 27·7 m.eq. per litre. Blood-culture was sterile, and there was no albuminuria; and an electrocardiogram showed only diphasic T waves in the standard leads.

Treatment and progress (see accompanying table).—The baby was nursed initially in an incubator, fed by compressed air, at a temperature of 84°F. 70 ml. of fresh frozen plasma and 85 ml. of 5% glucose were infused intravenously during the first twenty hours. Simultaneously 15 ml. of 5% glucose was given hourly by intragastric drip.

Fifteen minutes after the start of rewarming, skin erythema developed over the entire body except the feet. Later violent coarse limb tremors, preceded by crying, began; these continued intermittently for eight days. On the third day he had three generalised convulsions and appeared moribund. Both tremors and fits were probably due to hypoglycæmia. The blood-sugar level remained extremely low till the fourth day, when it reached a normal level following increased glucose dosage (30 g. daily). The glucose intake was then relaxed to 9–12 g. daily, and the hypoglycæmia promptly recurred (blood-sugar under 10 mg. on day 6). The temperature rose within twenty-four hours to 95°F; on the third day it fell transiently to 91°F, but thereafter it was never low again.

On the fourth day, because of oliguria and a rising hæmatocrit (73%), a further 50 ml. of fresh frozen plasma was given. On the sixth day the rectal temperature reached 97°F; pulse-rate 100–120; the child was bubbly at the mouth and showed generalised œdema; now congestion and pulsation of the neck and scalp veins became obvious; he vomited altered blood. In view of this evidence of cardiac failure digoxin was given, with remarkably good results; the signs of failure were relieved, and there was a brisk diuresis. Investigations at this stage (sixth day) showed serum-protein 4·8 g. per 100 ml., blood-urea 36 mg. per 100 ml., serum-potassium 6·05 m.eq. per litre, and serum-chloride 94 m.eq. per litre.

DATA ON CASE 2

—	Day								
	1	2	3	4	5	6	7	8	9
Blood-sugar (mg. per 100 ml.)	<10	<10	<10	100	..	<10	73	53	60
Glucose intake (g.)	6	12	36	30	9	12	23	25	20
Lactose intake (from breast-milk) (g.)	..	..	..	..	4	10	15	12	24
Hæmatocrit (%)	59	75	75	73	..	61	..	..	57
Fluid intake (intravenous and oral) (ml.)	180	350	325	280	230	240	260	430	400
Urine output (ml.)	26	32	35	4	28	180+	70+	43+	25+

Recovery after the successful treatment with digoxin was uneventful, and the child was discharged home when a month old. At the age of eight months he appeared quite normal.

Diagnosis

The facial erythema and misleading appearance of well-being exhibited by the majority of these infants when first seen have been emphasised in both the Palestinian and the Dutch reports. Nassau (1948) tellingly quotes the comment of a nurse: "The child is as florid as if it had just been for a winter's walk!" Much of the delay in recognition of the fact that the child is ill is undoubtedly due to this paradoxical erythema.

In 4 of our cases no-one had noticed before admission to hospital that the baby had become chilled, and in none of the 14 had the severity of the hypothermia been appreciated by the midwife or the family doctor. It cannot be too strongly stressed that in home confinements the baby's body-temperature should be recorded once daily at least, and that for this purpose a low-reading thermometer (range 85–110°F) should be used. With the conventional thermometer it is all too easy to assume that the reading shown is the baby's temperature, when in fact it represents merely the point to which the mercury was shaken down before use.

In most of the series no definite diagnosis had been reached by the doctor referring the case to hospital. In some an infective process was suspected; in others hæmatemesis or melæna led to a suspicion of hæmorrhagic disease of the newborn. We find that in hospital there is a strong tendency to attribute the infant's condition to an underlying infection or, if hardening of the panniculus becomes noticeable, to term the condition sclerema. These two diagnoses obscure the important fact that the disturbance is primarily due to exposure to cold.

It is true that a septic process in the newborn sometimes leads to slight depression of the temperature instead of the more customary rise, and doubtless when this

happens the infant will be more susceptible to chilling. While admitting that an infection may in this way predispose to hypothermia, we are convinced that in none of our series did sepsis play a major causal rôle.

Misinterpretation of the lung changes resulting from hæmorrhage has often contributed to the assumption that the cause was infective, especially when the final diagnosis was based solely on gross necropsy findings. Of course pneumonia may complicate cold injury; indeed prolonged hypothermia seems to predispose to infective complications. To quote Debré and Lelong (1952): "Le refroidissment sensiblise le nourisson à l'action des germes pathogènes. Ce sont des infections rhinopharyngées, otiques, pulmonaires."

There has always been great confusion over the use of the term sclerema. Yet as long ago as 1811 Underwood gave a masterly clinical description of that condition. Comparing his account with the syndrome described here it should be apparent that the two conditions have little in common and that their differentiation should be possible at first sight. Thus Underwood, describing sclerema, correctly refers to the yellowish-white discoloration of the skin and the appearance of dying, and also remarks (which we regard as a crucial point) that "The feel of the skin and flesh is hard and resisting but not œdematous." In contrast, in cases of neonatal cold injury the skin is often erythematous, the child does not look ill initially, and, when hardening of the skin and subjacent tissue has been present, œdema has always preceded and accompanied it.

Ætiology and Predisposing Factors

The majority of our infants with cold injury were first seen during spells of cold weather when minimum air-temperatures were below freezing-point. It was noticeable that cases tended to be admitted to hospital immediately after a sudden fall in outside temperature. Study of home circumstances, with special reference to the thermal environment to which the baby had been exposed, showed that in many instances the conditions were quite unsuitable for a confinement in winter time. We have found, as Munk (1937) did, that cold injury may occur in well-to-do surroundings; a comfortable and well-provided home may yet be cold.

Special hazards arise when delivery occurs in very cold weather after a move to fresh accommodation, as happened in two of our cases. Another source of trouble is the use of an open coal-fire for heating the room where the child is born and nursed; the room-temperature may fall precipitately in the early hours of the morning when the fire goes out. The same may happen with gas or electric heating if it is switched off at night as an economy measure; and this point needs special emphasis because fatal damage has occurred to infants at room-temperatures (59°F) which would be regarded as quite tolerable by adults in this country.

Cold injury does not develop in every infant exposed to a low temperature; certain other factors must help to precipitate it. As in adults (Pugh and Edholm 1955), the rate of cooling may be related to the thickness of the subcutaneous fat, which probably varies considerably from baby to baby, even in those of full gestational age. Other predisposing factors may be asphyxia at birth (McClure and Caton 1956), birth injury, and an infection of some kind (Yllpö 1935). Chilling is of course more likely if clothing and cot coverings are lacking; and then there is the risk of unnecessary cold exposure resulting from the routine cleansing bath—a ritual practice which we find may not be waived by the midwife even in the most frigid conditions (Talbot 1925).

A further aggravating factor, to which Campagne (1941) referred, may be inanition; this, if not operative initially, soon plays a part as the constantly occurring food refusal of the syndrome develops.

Treatment

The three essentials in the management of this disorder are to rewarm, to feed, and to prevent infection. Hitherto our approach has been empirical. The recommendations we make are based on the experience so gained and have not been fully proved in practice; nevertheless we feel that they may have some value, if only by marking the pitfalls we have encountered.

Rewarming

The best method of treating patients subjected to prolonged cooling is still disputed. There is general agreement that half-hearted rewarming is to be avoided (Burton and Edholm 1955); so the choice lies between active (rapid) rewarming (Grosse-Brockhoff 1950) or passive (slow) rewarming (Talbott and Burton 1951, Burton and Edholm 1955). Our experience of the rapid method has been limited to 1 case. Here, although the rewarming was quite successful, the child died thirty-two hours afterwards for no very clear reason; in retrospect, the most probable cause was overloading with intravenous fluid and there is no real justification for blaming the rewarming technique. In all other cases slow rewarming was used: either by nursing in an incubator with the circulating air maintained a degree or so above the infant's rectal temperature; or, more simply, by keeping the baby normally clothed in an ordinary cot at a room-temperature of 70–80°F—a method which seems to be equally effective.

Feeding

One of the first effects of rewarming is acceleration of the metabolic processes of the tissues, giving rise to increased demand for glucose. Since glycogen reserves may already have been severely depleted during the period of exposure to cold (Grosse-Brockhoff 1950, Burton and Edholm 1955) profound hypoglycæmia is liable to follow; this was present in at least 2 cases in our series. It seems to us extremely important to recognise and correct this hypoglycæmia; but, even where the pre-treatment blood-sugar is normal, glucose therapy is no less vital, as a considerable glycogen deficit may still exist. Administration of glucose reduces the proportion of "rewarming deaths" both in dogs (Ross 1954) and man (Grosse-Brockhoff 1950).

In these infants glucose, if it is to be effective, must be given in high dosage. Our experience in case 2, in which the infant was profoundly hypoglycæmic for three days and responded only to a glucose dosage of the order of 30 g. daily, seems to show that this amount was barely adequate; while theoretical considerations, taking into account not only the infant's basal energy requirements (Smith 1951) but the needs for rewarming and for replenishing the glycogen deficit, suggest that the figure of 30 g. might even be doubled for an infant of average size. The administration of so much glucose daily to a newborn infant is, however, a problem in itself. The usual 5% intravenous glucose is quite useless; if serious fluid overloading is to be avoided, a more concentrated solution must be given. Such a solution is liable to cause thrombosis when given intravenously, and we prefer, therefore, to give 15–20% glucose by continuous intragastric drip.

Although we found no liability to electrolyte imbalance in the few cases where biochemical studies were undertaken, it seems prudent not to continue glucose therapy alone for more than forty-eight hours. As soon as the infant's temperature rises above 90°F—which, with passive rewarming, it usually does within twenty-four hours—glucose may be given in milk, rather than in aqueous solution. There may indeed be no valid objection to the use of such a milk mixture from the beginning, but it seems probable that the simple glucose solution will be absorbed more rapidly.

The risk of fluid overloading must be guarded against. The hæmatocrit may be high when the infant is first seen and may continue to rise, even reaching a level of 75% as in case 2. When this trend occurs there may be a temptation to reverse it by giving intravenous plasma, but this should be resisted. The rising hæmatocrit value is the result of a fluid shift from one body compartment to another (Horvath 1951); and when, with rewarming, a contrary shift occurs, acute heart-failure may follow if plasma has been given. Our experience with case 2 and other cases last winter suggests that there is a need for extreme caution in giving intravenous fluids, plasma or others, in cases of cold injury.

Prevention of Infection

As infective processes are very difficult to detect in these babies, and as they seem unusually prone to septic complications, antibiotic therapy should be given from the outset. Because of uncertainty of absorption of drugs from the alimentary tract in hypothermia, parenteral treatment seems advisable until rewarming is well under way. Tetracycline is a useful antibiotic for prophylaxis, especially as it can be given intramuscularly or intravenously.

Other Treatment

Cortisone, because of its reported value in sclerema, might seem to be indicated in cases of cold injury. But, because of the susceptibility to infection, this treatment is hazardous, even with antibiotic cover; and we know of one case where an unsuspected suppurative appendicitis was found at necropsy in a hypothermic infant treated with cortisone and oxytetracycline (R. W. Brookfield and B. W. Neal, personal communication).

Hypothermia prolongs the action of certain drugs (Herrmann 1941). Because of this, barbiturates, and especially phenobarbitone, must be administered very cautiously. If fits occur the possibility of hypoglycæmia must be seriously considered; and increased glucose administration, possibly coupled with subcutaneous adrenaline, may be more effective and less dangerous than anticonvulsant therapy.

Both Grosse-Brockhoff (1950) and Burton and Edholm (1955) concluded that oxygen administration is without value in hypothermia, and this has certainly been our impression in one or two cases where it has been used from the beginning of treatment. We have considered the possibility that pulmonary hæmorrhage might have been due to over-use of oxygen, but this seems unlikely because in at least one of the cases lung hæmorrhage began before any oxygen had been given.

Prevention

There can be no question that neonatal cold injury is preventable, and that, with wider recognition of the cause, its incidence will be greatly reduced. Smallpeice (1955) has rightly observed that it is a reproach to us all that newly born infants should become chilled in icy bedrooms in cold weather. Young infants need constant warmth by day and night. No less dangerous than the coal fire going out in the early morning are lukewarm baths in cold surroundings, electric or gas fires switched off for economy's sake, or exercise of the popular British belief that some mystic quality of health resides in a stream of cold air coming through an open window.

In many homes it is simply not practicable to maintain in really cold weather a steady air-temperature of 65°F or more in the room in which a baby is born and nursed. There are two possible solutions. Firstly, the home conditions for a confinement which is expected in winter should be rigorously assessed; if the heating appliances are obviously inadequate, delivery should take place in hospital. Alternatively, some form of safe portable heating equipment should be provided for use during and after the delivery.

The main task, in prevention, is to ensure that those concerned in domiciliary midwifery are alert to the danger of exposing the baby to cold. The simple rules for midwives set out in the appendix may help to encourage such watchfulness.

Summary

Neonatal cold injury is a not uncommon disorder with a high mortality. Cases generally arise after home confinements, especially in severely cold weather.

Commonly the disorder is misdiagnosed as hæmorrhagic pneumonia or sclerema, the predominant rôle of exposure to cold being overlooked.

Presenting features may include increasing apathy, food refusal, coldness to touch, and oliguria; but the infant does not look ill.

The most constant clinical findings are hypothermia, œdema of the extremities, purulent nasal discharge, and striking skin erythema which contributes to the misleading appearance of well-being.

The treatment advised is slow rewarming, liberal glucose administration by intragastric drip, and antibiotic cover.

Prevention, which is of paramount importance because of the high mortality, can be achieved only by safeguarding against a fall in room-temperature. This requires watchfulness by professional personnel, who should warn parents of the risk.

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Appendix

1. In assessing for a home confinement bear in mind the season when the delivery is expected. Ensure in advance that the lying-in room can be properly heated; if there is any doubt about this seek medical advice.

2. Make sure, in good time, that the baby is adequately provided for, especially as regards garments and cot coverings.

3. The temperature of the room where the baby will be born and subsequently nursed should not be allowed to drop below 65°F in the first fourteen days of life. Wall thermometers on which the 65°F low limit is clearly marked should be fixed in full view in or near the baby's cot. The parents should be told how to read the thermometer and what action to take if the room-temperature falls below the critical level.

4. Premature infants are especially prone to chilling and may require a warm environment for some weeks. At times this applies equally to newborns whose birth-weights exceed $5^1/_2$ lb.

5. In winter newborn babies should not be bathed except in thoroughly warm surroundings (70°F).

6. The baby's clothing should not restrict free bodily movement which, within loose but adequate wrappings, aids the maintenance of body warmth.

7. The baby's rectal temperature should be read and recorded at least once daily for fourteen days. In cases showing temperature instability readings should be continued even longer.

8. Mothers should be told to feel the baby's face and extremities periodically and to report if the skin feels cold.

9. If the rectal temperature falls to 96°F or below, medical aid should be sought. In providing extra warmth in such instances, avoid increased wrappings which will insulate the baby from surrounding warmth.

10. Birth injury and asphyxia (blue or white) both predispose to chilling in the newborn. Babies so affected, regardless of birth-weight, require careful scrutiny and may need additional warmth.

11. A coal fire in the delivery room should not be used as an incinerator for damp and soiled maternity dressings after the birth.

SYPHILITIC AORTIC INCOMPETENCE
WITH SPECIAL REFERENCE TO PROGNOSIS AND EFFECT OF TREATMENT

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MORE than ten years have elapsed since penicillin was first used in cardiovascular syphilis. No study of its long-term results has yet been published. Moreover the prognosis of the various forms of cardiovascular syphilis remains uncertain. Since uncomplicated aortitis, aneurysm, and aortic incompetence have an inherently different prognosis, it is obviously necessary to consider each form of cardiovascular syphilis separately. The present investigation was therefore limited to cases of aortic incompetence. It was undertaken to establish the prognosis of syphilitic aortic incompetence, to estimate the influence of various factors on the prognosis, and to assess the value of the different forms of treatment, including penicillin.

Many workers have held that the average survival of patients with syphilitic aortic incompetence is only 2 years from the onset of symptoms. Most estimates have been based on American series containing a high proportion of Negroes, in whom the prognosis is admitted to be poorer than in white people. The largest series of cases of syphilitic aortic incompetence confined to white people in the English literature are those of Cotton (1926), Grant (1933), and Grimble (1955); their findings are discussed below.

Material and Methods

The present series consists of 374 patients in whom syphilitic aortic incompetence had been diagnosed at the National Heart Hospital (183 cases), the cardiac department of the London Hospital (93 cases), the department of cardiology of the Middlesex Hospital (73 cases), the Norfolk and Norwich Hospital (19 cases), and St. Bartholomew's Hospital (6 cases). The study covers 30 years (1926–55) and is based on the careful examination of the very full clinical records of these patients and on personal examination of 32 of the 102 survivors.

TABLE I—AGE AND SEX DISTRIBUTION

Age	20–29	30–39	40–49	50–59	60–69	70–79	80 or more	Total
Male	—	25	51	102	79	11	1	269
Female	2	13	37	32	17	4	—	105
Total	2	38	88	134	96	15	1	374

Every patient had aortic incompetence without any other valvular lesion. In 360 patients (96%) either the Wassermann or the Kahn reaction was positive. In the remainder necropsy findings (5), calcification and dilatation of the ascending aorta (4), a positive treponemal immobilisation test (3), and tabes dorsalis (2) provided evidence of syphilis. All patients with saccular aneurysm of the aorta and general paresis were excluded. 15 patients with tabes dorsalis and 1 with syphilitic meningomyelitis were retained because the outcome was unaffected by the neurological condition. In addition 28 patients had minor neurological abnormalities on clinical examination, and a further 7 patients had an abnormal cerebrospinal fluid without neurological signs. Other conditions present included carcinoma (3), diabetes mellitus (3), rheumatoid arthritis (3), ankylosing spondylitis (2), Reiter's syndrome (1), and pulmonary tuberculosis (1).

The age and sex of the patients are shown in table I. The sex ratio was about 2·5 males to 1 female. The mean age was 54. The maximal incidence was in the fifth and sixth decades in females and in the sixth and seventh decades in males. All the patients were of European origin except 2 Negroes and 1 Chinese. Of the 374 patients 224 were followed either to death or to the present time by examination of the hospital records or by writing to the patients or to their general practitioners. Of the 150 patients who were not discovered by these means 100 were later traced from the deaths recorded in Somerset House. Eventually only 50 patients (13%) remained untraced.

Clinical Features

Previous History

111 patients (30%) gave a past history of either primary syphilis or gonorrhœa. The mean interval from the primary infection to the diagnosis of aortic incompetence was 31 years (range 8–52 years). Information on the type and quantity of antisyphilitic treatment given in the early stages of the disease was scanty.

Symptoms

49 patients (13%) were symptom-free at the time of diagnosis; this group is analysed separately later. The symptoms described by the remaining 325 patients were breathlessness on exertion, 234 (72%); cardiac pain, 180 (55%); paroxysmal nocturnal dyspnœa, 71 (22%); atypical chest pain, 33 (10%); palpitation, 25 (8%); loss of weight, 18 (6%); and Adams-Stokes attacks, 2 (0·7%). The mean duration of symptoms before diagnosis was 17 months.

Palpitation was mentioned by 25 patients. In a few instances it was due to uncontrolled auricular fibrillation; 2 patients had attacks of paroxysmal auricular tachycardia.

Loss of weight was a prominent symptom in at least 18 patients (14 males, 4 females; mean age 52) and may have been overlooked in others. This symptom appears to carry a bad prognosis: the mean survival of the 15 patients who died was only 27 months. (The mean survival of all the patients who died in the whole series was 48 months.)

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Adams-Stokes attacks occurred in 2 patients with complete heart-block.

Physical Signs

The characteristics of the aortic second sound and diastolic murmur are too well known to need further consideration here. Attention is, however, drawn to a few of the lesser-known physical signs which may be present.

Systolic murmurs.—A systolic murmur was heard in 315 cases (84%); it was present in 30 of 32 patients personally examined.

Thrills.—42 patients (11%) had a systolic thrill at the aortic area; 21 patients (6%) had a diastolic thrill; in 11 patients both systolic and diastolic thrills were present. A *systolic* thrill may result from aortic valvular stenosis, which rarely supervenes in syphilitic aortitis as a result of atherosclerotic degeneration. Most workers agree that an aneurysm may cause a systolic thrill, but it is usually denied that a systolic thrill can occur in syphilitic aortic incompetence without aneurysm (Friedberg 1949, Wood 1956). Of 7 of these 42 patients examined post mortem none had aortic stenosis or aneurysm. A *diastolic* thrill in aortic incompetence is commoner in syphilis than in rheumatism; it usually results from gross retroversion of the valve cusps, as in the 2 patients in this series examined at necropsy.

Austin Flint murmur.—A delayed diastolic murmur at the apex, with or without presystolic accentuation, was noted in 29 patients (8%). The mitral and tricuspid valves were normal in 6 of these patients at necropsy. Left ventricular failure was present in 15 of the 29 patients, and in some the murmur disappeared as the failure improved. Laubry and Pezzi (1926) observed that the murmur was usually heard in the presence of left ventricular failure.

Arrhythmias.—26 patients (7%) had auricular fibrillation at some stage of their illness; as expected, it was commoner in the older patients. The mean age at the onset of auricular fibrillation was 60. Complete heart-block was present in 3 patients; in 1 of these a fibrous plaque in the region of the bundle of His was found at necropsy. Paroxysmal auricular tachycardia occurred twice, and partial heart-block once.

Hypertension.—43 patients (12%) had a systolic pressure higher than 200 mm. Hg, and 8 of these had a diastolic pressure higher than 95 mm. Hg. In several others moderate hypertension developed terminally in association with congestive failure.

Investigations

Wassermann Reaction

As already stated, the Wassermann reaction was initially positive in 360 patients (96%). The effect of treatment on the Wassermann reaction was studied in 116 patients. In 29 (25%) the test became negative after treatment; in 87 patients (75%) it remained positive. It was impossible to compare the effect of different forms of treatment on the reaction.

Treponemal Immobilisation Test

This test was positive in 5 patients in whom the Wassermann reaction was originally negative or became so; all had received previous treatment with either penicillin or arsenic and bismuth.

Erythrocyte-sedimentation Rate

The erythrocyte-sedimentation rate (E.S.R.) is raised in most untreated cases of cardiovascular syphilis (Danzer 1931, Wood 1936). Results of this investigation were available in 143 patients (38%) at some stage of the disease. The standard Westergren method was used in nearly every case. The mean initial reading in these 143 patients was 27 mm. after 1 hour.

In 73 patients the E.S.R. was estimated before any antisyphilitic treatment had been given; the mean E.S.R. in this group was 32 mm. The effect of congestive heart-failure in retarding the E.S.R. was less than had been expected: 25 of the 73 patients had congestive heart-failure and a mean E.S.R. of 27 mm.; the mean E.S.R. of the 48 patients without congestive heart-failure was 35 mm. However, 36% of the patients with heart-failure had a normal E.S.R. (0–10 mm.), whereas only 20% of the patients without heart-failure had a normal E.S.R.

The effect of treatment on the E.S.R. was studied in a small group of cases. In 26 patients the E.S.R. was estimated before and immediately after a course of penicillin; the mean reading before treatment was 33 mm. and after treatment 34 mm. However, a year or more after treatment with penicillin the mean E.S.R. in 31 cases was only 13 mm. These findings suggest that effective treatment lowers the E.S.R. slowly over many months.

Wood (1936) noted that 4 of his patients with a very high E.S.R. died quickly. In the present series 24 patients had an initial reading higher than 50 mm.; 11 had heart-failure. 15 of the 24 are dead, and their mean survival was only 14 months, compared with a mean survival of 48 months for all the patients who died in this series. Of the remaining 9 patients 5 are untraced; of the 4 survivors all have received penicillin, and the E.S.R. in 3 of them has fallen to 17 mm., 8 mm., and 8 mm.; it was not estimated in the 4th patient.

Radiography

Radiographs of 64 patients were personally examined. Calcification of the ascending aorta was present in 22 (35%) and was confined to the ascending aorta in 7. There was calcification of the arch in 21, the descending aorta in 6, and the aortic valve in 4. The aorta was normal in 6 patients and enlarged to various degrees in 58. The left ventricle was normal in 5 and enlarged in the remainder.

Either radiological reports or orthodiagrams were available for 282 patients: calcification of the ascending aorta was noted in 16 of these; the aorta was specifically described as normal in 37; and the left ventricle was said to be normal in 18.

If carefully sought, the true incidence of calcification of the ascending aorta in syphilitic aortitis is likely to be about 40% (Thorner and Carter 1948); in the present series this is close to the proportion found in the films personally examined. It is often necessary to take oblique and postero-anterior films with highly penetrating X rays to show the calcium, which is sometimes more easily detected by fluoroscopy.

Calcification probably results from atherosclerotic degeneration superimposed on syphilitic aortitis; it would therefore be expected to occur more commonly in older patients. The mean age of the patients in this series with calcification of the ascending aorta was 63. Calcification of the ascending aorta is rare in atheroma alone (Jackman and Lubert 1945) and is therefore important in differential diagnosis.

Electrocardiography

We examined 342 electrocardiograms, but most of the earlier tracings were confined to the standard limb leads. Twelve-lead electrocardiograms were available for 74 patients, and these were separately analysed. Table II shows the findings.

The term "left ventricular strain" has been used where definite ST depression and/or T-wave inversion has occurred in left-sided precordial leads and in other leads depending on the electrical position of the heart. "Left ventricular hypertrophy" describes voltage changes in the standard and unipolar limb leads and precordial leads in excess of the various criteria of

TABLE II—ELECTROCARDIOGRAPHIC FINDINGS

—	12-lead E.C.G.	Standard leads	Total
Number of patients	74	268	342 (100%)
Normal E.C.G.	6	47	53 (15%)
Left ventricular strain only	23		
Left ventricular hypertrophy only	3	189	251 (73%)
Left ventricular hypertrophy and strain	36		
Cardiac infarction and ischæmia	11	10	21 (6%)
Auricular fibrillation	6	20	26 (7%)
Left bundle-branch block	4	12	16 (5%)
Right bundle-branch block	2	10	12 (4%)
Complete heart-block	1	2	3 (1%)

Goldberger (1953), Sokolow and Lyon (1949), and Gubner and Ungerleider (1943). It was impossible to differentiate left ventricular hypertrophy and strain in the standard leads only. It is often very difficult to decide whether ST segment and T-wave changes are due to left ventricular strain or to myocardial ischæmia.

We found only a rough correlation between the electrocardiograms and the diastolic blood-pressure, cardiac pain, and heart-failure. Many of the patients for whom a twelve-lead electrocardiogram is available are still alive, and it was impossible to correlate the electrocardiogram with survival.

Causes of Death

222 patients died, and the cause of death was ascribed to the cardiovascular system in 207. The other causes of death were cerebral thrombosis or hæmorrhage, 4; carcinoma, 3; pulmonary tuberculosis, 1; appendicitis, 1; pancreatitis, 1; uræmia, 1; hæmatemesis from

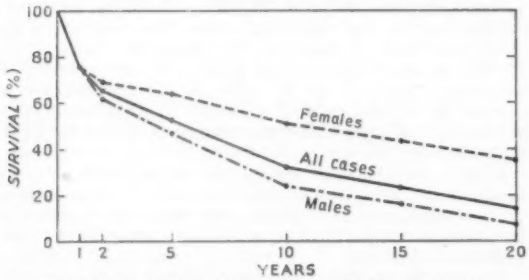

Fig. 1—Survival-rate of whole series and of males and females.

gastric ulcer, 1; coal-gas poisoning, 1; barbiturate poisoning, 1; and war injuries, 1.

Of 60 patients who came to necropsy all had syphilitic aortitis. Detailed information about the aortic valve was available in 36 patients; the incompetence was considered by the pathologist concerned to be due mainly to cusp damage in 31 and to stretching of the aortic ring in 5.

The coronary ostia were specifically described in 35 cases: the right ostium was normal in 8, narrowed in 21, and occluded in 6; the left ostium was normal in 12, narrowed in 20, and occluded in 3. Of the patients with normal ostia 3 had complained of cardiac pain; in 1 of these the left coronary artery was occluded 1·3 cm. beyond the ostium by a mass of syphilitic arteritis, a rare finding in this disease; 1 other patient had moderate atheroma of the coronary arteries. In 11 of the patients with ostial stenosis or occlusion there had been no history of cardiac pain.

The coronary arteries were described in 19 patients, and only 4 had a moderate degree of atheroma.

Bacterial endocarditis of the aortic valve was found in 1 patient; it had been suspected clinically in 2 others but not proved.

Factors Influencing Survival

Of the 374 patients 222 are dead, 102 are alive, and 50 are untraced. The survival of the whole series was determined, and an attempt was made to assess the effect of various factors on survival. It is usual to calculate survival from the date of onset of symptoms. Because of the difficulty in determining accurately the onset of breathlessness, we have calculated survival *from the date of diagnosis* unless otherwise stated.

Merrell and Shulman (1955) have pointed out the fallacy of relying on the mean length of survival of patients who subsequently died when a considerable proportion of the original patients are alive or untraced. We have therefore calculated the percentage survival according to the life-table method (see Merrell and Shulman 1955). In certain instances, however, we have also calculated the mean length of survival of patients

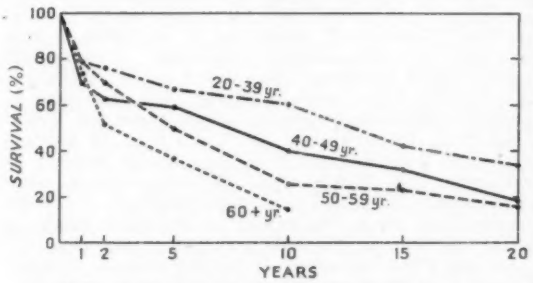

Fig. 2—Survival-rate of patients in different age-groups.

who subsequently died; it is important to remember that these figures will be an underestimate. This error will proportionately increase with larger numbers of untraced and surviving patients.

Age and Sex

Fig. 1 shows the survival-rate of the entire series and of males and females separately. It will be noted that 75% survived 1 year, 54% survived 5 years, 32% survived 10 years, and 14% survived 20 years. Females had a better prognosis than had males after the first year.

The effect of age at diagnosis on survival is shown in fig. 2, which shows the better prognosis of the younger patients after the second year. Thus, after 10 years, 60% of those aged less than 40 are still alive, compared with only 15% of those aged more than 60. Table v shows that heart-failure was much commoner in the older age-groups. This was probably the main cause of the poor prognosis of the older patients, but the older age-groups contained a higher proportion of males

TABLE III—EFFECT OF AGE, SEX, CARDIAC PAIN AND HEART-FAILURE ON SURVIVAL

—	All cases	Males	Females	Age (yr.)				Angina	Heart-failure
				20–39	40–49	50–59	60 or more		
Total	374	269	105	40	88	134	112	180	111
No. of patients who died	222	168	54	19	57	77	69	121	89
Mean survival of patients who died (mos.)	48	42	66	71	69	45	26	56	18

(table I). It is therefore difficult to separate the effects of age and sex on survival.

Table III shows the mean survival of patients who died and of the different sex and age-groups. These figures also show the better prognosis of the female and younger patients.

Occupation

Inadequate data prevented an assessment of the effect of occupational factors on survival.

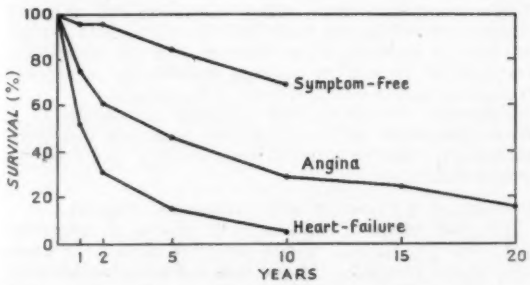

Fig. 3—Survival-rate of symptom-free patients and of patients presenting with angina and with heart-failure.

Lack of Symptoms

49 patients (35 males, 14 females, mean age 52 years) who were free from symptoms at the time of diagnosis were analysed separately. McDermott et al. (1942) emphasised the good prognosis in such patients, and the present series confirms this. Fig. 3 shows that 96% were alive 2 years after diagnosis, 84% 5 years, and 69% 10 years. Most of them had been intensively treated with penicillin and bismuth. The good prognosis of aortic incompetence before the development of symptoms emphasises the importance of diagnosis and treatment at this stage of the disease.

Cardiac Pain

This occurred in 180 patients; of these, 153 had angina of effort and 77 angina at rest, especially at night. Table IV shows the age and sex of patients presenting with cardiac pain. Angina was particularly common as a presenting symptom in women aged less than 50. The sex ratio was 2·4 males to 1 female. Jones and Bedford (1943) fully described the pain of cardiovascular syphilis and concluded that the pain did not differ from that in coronary-artery or in aortic-valve disease. Our personal observations accord with their conclusion.

TABLE IV—AGE AND SEX OF PATIENTS PRESENTING WITH CARDIAC PAIN

Sex	Age (yr.)			
	20–49	50–59	60 or more	Total
Male ..	34 (45%)	54 (53%)	38 (42%)	126 (47%)
Female ..	32 (62%)	15 (47%)	7 (33%)	54 (51%)

Angina in syphilitic aortic incompetence is usually considered to carry a bad prognosis (Friedberg 1949, Levy 1951, Evans 1956, Wood 1956). Jones and Bedford (1943) found that the average survival of their patients who died with syphilitic angina was 29 months (67% of their series had aortic incompetence). In our series 180 patients presented with angina; the mean survival of 121 patients who died was 73 months from the time of onset of angina and 56 months from the time of diagnosis of aortic incompetence (range 0–324 months; see table III). 29 patients are alive, and the mean survival of this group so far is 115 months from the onset of angina and 100 months from the date of diagnosis. These figures may be compared with those of Reader et al. (1947), who found the mean survival of patients with cardiac pain in syphilitic aortic incompetence to be 9·4 years. Fig. 3 shows that 39% of patients presenting with angina lived for 10 years and 16% for 20 years. Three-quarters of this small group of long survivors are women; more than half have continued to have angina throughout the course of their disease; some have had long remissions.

TABLE V—AGE AND SEX OF PATIENTS PRESENTING WITH HEART-FAILURE

Sex	Age (yr.)			Total
	20–49	50–59	60 or more	
Male ..	16 (21%)	32 (31%)	39 (43%)	87 (32%)
Female ..	8 (15%)	7 (22%)	9 (43%)	24 (23%)

One woman presented in 1930, at the age of 34, with 5 months' history of typical angina of effort and with, more recently, nocturnal attacks. On examination by Sir Thomas Lewis she had mild aortic incompetence; the Wassermann reaction was positive. She was seen by us 26 years later, at the age of 60; she was still having typical attacks of angina. The physical signs were unchanged except that she had developed auricular fibrillation; the Wassermann reaction was still positive.

It is apparent from this series that the prognosis of angina in syphilitic aortic incompetence is not nearly so serious as has been previously held. Long survival, particularly in women, is not rare. This symptom is especially common in young women in this disease (table IV); unlike heart-failure, angina as a presenting symptom does not become more common with increasing age. An average survival of 7–9 years is very like the average survival of patients with angina pectoris in ischæmic heart-disease (White et al. 1943).

TABLE VI—RELATION OF DIASTOLIC BLOOD-PRESSURE TO SURVIVAL

Diastolic B.P. (mm. Hg)	0–30	35–50	55–70	75 or above
Total no. of patients	28	104	144	98
No. of dead patients	17	72	82	51
Mean survival of dead patients (mos.)	33	40	51	59

Heart-failure

A clear history of paroxysmal nocturnal dyspnœa or definite signs of congestive heart-failure was present in 111 patients (30%) at the time of diagnosis. The age and sex of these patients are shown in table V. The sex ratio was 3·6 males to 1 female, a higher male preponderance than in the series as a whole. Heart-failure became increasingly common in the older age-groups.

The grave prognosis of heart-failure is clearly shown in fig. 3: 52% survived 1 year, 31% survived 2 years, and only 15% survived 5 years. Table III shows that the mean survival of the 89 patients who died was only 18 months (range 0–100 months).

TABLE VII—TREATMENT GROUPS

Group	Males	Females	Total
1, "Inadequately treated"	51	11	62
2, Arsenic and/or bismuth	43	20	63
3, Penicillin alone	28	14	42
4, Penicillin plus arsenic or bismuth ..	49	28	77

Diastolic Blood-pressure

In the absence of associated hypertension or of heart-failure the diastolic blood-pressure is accepted as a good guide to the severity of aortic incompetence. Table VI shows the relation of the diastolic blood-pressure to survival. It confirms the impression that patients with the lowest diastolic pressure have the poorest prognosis.

Effect of Treatment on Survival

Information on the treatment given was available in 367 patients. Barnett (1933) pointed out that patients dying within a year would tend to be included in the inadequately treated group. This group would thus be unfairly weighted with seriously ill patients. We therefore eliminated 84 patients who died within a year of diagnosis and 39 patients who had been followed for

TABLE VIII—MEAN SURVIVAL OF PATIENTS WHO DIED

—	Group 1	Group 2
Total no. of patients	62	63
No. of dead patients	53	46
Mean age of dead patients (yr.)	55	49
Mean survival of patients who died (mos.)	63	115 (group 2a 88, group 2b 135)

less than a year; 244 patients remained for analysis. These were divided into four groups according to the treatment given (table VII).

The criteria for inclusion in each group were as follows:

Group 1: patients who received only potassium iodide and mercury by mouth and less than 6 injections of arsenic or bismuth.

Group 2: patients who received at least 6 injections (about 3·0 g.) of arsenic or 6 injections (1·2 g.) of bismuth. This group was later subdivided into:

Group 2a: a "partly treated" group who received 6–11 injections (about 3·0–5·5 g.) of arsenic or 6–17 injections (1·2–3·4 g.) of bismuth.

Group 2b: a "fully treated" group who received at least 12 injections (6·0 g.) of arsenic or 18 injections (3·6 g.) of bismuth or 6 injections (3·0 g.) of arsenic plus 9 injections (1·8 g.) of bismuth.

Group 3: patients who received at least 4·0 mega units of penicillin in 8 days (most patients had received a considerably larger dose).

Group 4: patients who received the above-mentioned course of penicillin and at least 6 injections of either arsenic or bismuth.

As will be seen, considerable difficulty was found in ensuring that the different groups of cases were truly comparable. It was necessary to eliminate many patients, and the final size of each group is relatively small. Even then it is impossible, because of the natural history of the disease, to be certain that the results are of definite significance.

Comparison of Arsenic and Bismuth with "Inadequate Treatment"

Table VIII shows the mean survival of the patients who died in groups 1, 2a, and 2b. If group 1 is compared with group 2, it appears that the survival period was

TABLE IX—MEAN SURVIVAL OF PATIENTS WHO DIED AGED LESS THAN 60 WITHOUT HEART-FAILURE

—	Group 1	Group 2a	Group 2b
Total no. of patients	27	17	28
No. of dead patients	22	13	20
Sex ratio of dead patients	M 14/F 8	M 9/F 4	M 14/F6
Mean age of dead patients (yr.)	48	50	49
Mean survival of patients who died (mos.)	100	110	151

nearly doubled by treatment with either arsenic or bismuth. Further examination of these figures, however, revealed three important fallacies: (1) 44% of group 1 were aged more than 60, compared with only 13% of group 2; (2) 34% of group 1 had heart-failure at diagnosis, compared with only 16% of group 2; and (3) group 1 contained 80% males and group 2 only 67% males. All these factors combined to load the "inadequately treated" group with patients having a poorer prognosis for other reasons. Accordingly, all patients aged more than 60 and all patients with heart-failure were eliminated. The amended results are shown in table IX. These selected groups, though small, were more comparable for sex and age, the balance slightly favouring the "inadequately treated" group.

Similar results were obtained by calculating the survival of these selected patients from groups 1 and 2b according to the life-table method (see fig. 4 and table X). This method, of course, utilises the living and untraced patients as well as the dead and therefore gives a truer estimate of survival. The difference in the percentage survival at 10 and 20 years is statistically significant (P approximately 0·03 and 0·005 respectively).

From the results of both methods of calculation it seems justifiable to conclude that intensive treatment with arsenic and/or bismuth substantially increased the period of survival.

Comparison of Penicillin with Arsenic and Bismuth

The difficulties of assessing the effects of treatment are even greater as regards penicillin than as regards arsenic and bismuth. 119 patients had been treated with penicillin: 42 alone and 77 with either arsenic or bismuth. Analysis of the patients who received penicillin alone (group 3) shows that, as in group 1, there was a high proportion of elderly and ill patients. Thus 46% of group 3 were aged more than 60, compared with only 22% of group 4. 26% of group 3 had heart-failure, compared with only 10% of group 4.

It therefore appears that the elderly and ill patients who, in pre-penicillin days, would have been "inadequately" treated are now given a course of penicillin alone. The younger and fitter patients in this series have usually received at least one course of arsenic or of bismuth in addition to penicillin. Moreover 35 patients in group 4 were symptom-free at the time of diagnosis; this would favourably influence the prognosis of this group, since hardly any patients in the other groups were asymptomatic.

TABLE X—EFFECT OF TREATMENT ON PERCENTAGE SURVIVAL-RATES (EXCLUDING PATIENTS AGED MORE THAN 60, ASYMPTOMATIC PATIENTS, AND PATIENTS WITH HEART-FAILURE)

—	Group 1	Group 2b	Group 3	Group 4
Males	19	17	10	15
Females	8	11	8	13
Total	27	28	18	28
Mean age (yr)	48	48	49	49
Percentage survival:				
At 1 yr.	100	100	100	100
,, 2 yr.	92	100	83	93
,, 5 yr.	76	88	83	85
,, 10 yr.	31	60	50	63
,, 15 yr.	16	52		
,, 20 yr.	5	35		

Another difficulty is that in groups 3 and 4 more than half the patients are still alive; it is thus impossible to calculate reliable figures for the mean survival of patients who died in these groups.

We therefore calculated the survival-rates of groups 1, 2b, 3, and 4 by the life-table method after eliminating asymptomatic patients, and patients aged more than 60, and patients with heart-failure. The results are shown in fig. 4 and table X.

It appears that the combination of penicillin with arsenic or with bismuth is not better than a full course of arsenic or of bismuth alone. Patients treated with

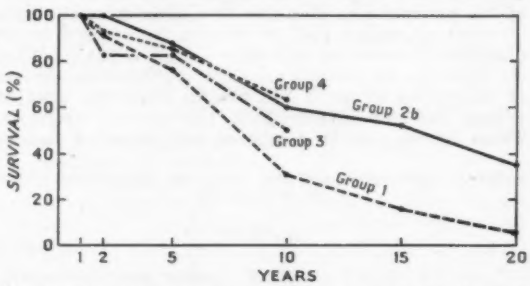

Fig. 4—Effect of treatment on survival: group 1, "inadequately treated"; group 2b, arsenic and/or bismuth; group 3, penicillin alone; group 4, penicillin plus either arsenic or bismuth.

penicillin alone, however, had a rather lower survival-rate than patients in groups 2b and 4. The "inadequately" treated group fared worst of all.

Discussion

The previous literature on the prognosis of syphilitic heart-disease is confused and difficult to interpret. Uncomplicated aortitis, aneurysm, and aortic incompetence have often been grouped together. Many of the series are too small for reliable statistical assessment.

One of the earliest reports in this field was that of Bruce (1911), who estimated that the mean survival of 24 patients who had died with cardiovascular syphilis was 5·3 years from the onset of symptoms. Not all these patients had aortic incompetence.

Cotton (1926) reported a controlled series of 114 patients with aortic incompetence, half of whom received annually a 6-week course of arsenical injections. The treated and control patients "closely resembled each other in age, symptoms, and signs." During 5 years' observation he found a mortality-rate of 24% among the treated patients and 34% among the controls.

Moore and Danglade (1930) and Moore et al. (1932) found a mortality-rate of 90% in untreated patients with all varieties of cardiovascular syphilis during 5 years' observation; the comparable mortality among the treated patients was only 40%. The mean survival of untreated patients with aortic incompetence alone was 32 months from the onset of symptoms; the mean survival of the treated patients was 65 months.

Barnett (1933) criticised these results: he pointed out that the inadequately treated group was heavily weighted with patients with heart-failure and with patients dying within a year. He presented a series of 99 patients which showed the fallacy of drawing conclusions from groups of patients that were not initially comparable.

In reply to these criticisms Padget and Moore (1935) re-examined 165 patients previously described by Moore et al. (1932). They excluded all the patients who had died within a year of diagnosis. They found that, in patients who had died with aortic incompetence, intensive treatment with arsenic and heavy metals improved the prognosis only 1·37 times. This figure was said to be not of certain statistical significance.

Meanwhile Grant (1933), in the United Kingdom, had published his review of 1000 patients with valvular heart-disease, of whom 189 had syphilitic aortic incompetence; 20 also had aortic aneurysm. He found that the average duration of life was more than 5 years, and that more than a third of the patients survived 10 years. His good results have been partly attributed to the fact that his patients were ex-Service pensioners leading a sheltered life. He discussed the influence of treatment on prognosis and concluded that intensive treatment with arsenic reduced the mortality-rate over a 10-year period from 57 to 41%, when cases of aneurysm, great cardiac enlargement, and congestive failure were excluded.

Stratton's (1935) series is too small to be of much value in assessing prognosis, and his inadequately treated patients include a very high proportion with heart-failure.

Cole (1937) eliminated all patients observed for less than a year and found that intensive treatment in cases of aortic incompetence increased the mean survival from 40 to 55 months.

Kampmeier and Combs (1940) reported 163 patients with aortic incompetence, of whom 128 were Negroes. They found that 54·6% of the patients died within 3 years. After excluding patients who died within a year from the onset of symptoms they concluded that treatment with arsenic and bismuth improved the mean survival of their patients who had died from 41 to 89·5 months in white males and from 30·8 to 43·7 months in Negro males.

In recent years several papers have been published on 1020 cases of aortic incompetence from the Johns Hopkins and New York Hospitals (Padget et al. 1950, Densen et al. 1952, Webster et al. 1953). In spite of the exceptionally large number of cases no conclusions were reached on the effects of treatment on survival. 119 of their patients had received penicillin, but no further information was given. To give their series "clinical value" these workers included some patients who were later proved not to have syphilitic aortic incompetence. In 14% of 219 necropsies the diagnosis was proved to be wrong; if, in this respect, the group that came to necropsy is representative of the entire series, a substantial element of error may have been introduced into the results. However, the estimates of the effect of sex, age, angina, and heart-failure on prognosis were broadly similar to ours.

Two recent American reviews have appeared in a British journal: (1) Beerman (1953) summarises the difficulties in assessing prognosis; and (2) O'Brien et al. (1955) present 578 cases of cardiovascular syphilis, of whom only 132 had aortic incompetence (70% were Negroes). They concluded that treatment with arsenic and bismuth had no demonstrable effect on survival; only 10 of their patients were treated with penicillin.

Grimble (1955) reported 164 patients with aortic incompetence and aneurysm seen at Guy's Hospital between 1925 and 1944. In a small selected group of patients with aortic incompetence of comparable age without heart-failure adequate treatment with arsenic or with bismuth increased the mean survival from 25·5 months to 54·0 months after the onset of symptoms.

From this review of previous work it is apparent that the effectiveness of arsenic and heavy-metal treatment has never been universally accepted (*Lancet* 1956). After excluding all patients dying within a year of diagnosis, all patients with heart-failure, and all patients aged more than 60 we have been left with two fairly comparable series of patients: "inadequately treated" (group 1) and "fully treated" (group 2b). The results indicate that, in these selected patients, the duration of life after the diagnosis of aortic incompetence has been considerably prolonged by treatment with arsenic and/or bismuth. The results in the "partly treated" group (group 2a) are intermediate between those obtained in groups 1 and 2b (table IX). This is further evidence that the prolongation of life is really due to the treatment and not to some hidden bias unconsciously introduced in the selection of cases.

No long-term study of the effect of penicillin on survival has yet been published. In view of the large numbers of penicillin-treated patients in the present series who are still alive our results can be provisional only. Not until all the patients are dead can a firm conclusion be reached on the efficacy of penicillin. With these reservations our results indicate that combined treatment with penicillin and either arsenic or bismuth is not more effective than a full course of either arsenic or bismuth alone. Penicillin is, of course, much easier and safer to administer and need not be withheld from any patient, however ill. The survival-rate of patients treated with penicillin alone, however, is not quite so good as that of those receiving arsenic and/or bismuth. Until further and longer follow-up studies have been published, it appears unjustifiable to rely on penicillin alone. Probably it is best to give at least one full course of arsenic or bismuth to every patient in addition to penicillin.

Summary

374 patients with syphilitic aortic incompetence are reported. 222 patients died and 102 survive.

Of the entire series 75% were alive after 1 year, 54% after 5 years, 32% after 10 years, and 14% after 20 years. The mean survival of all those who died was 48 months from the date of diagnosis.

Female and younger patients had a more favourable prognosis.

49 patients were free from symptoms at the time of diagnosis; this group had a good prognosis, 84% being alive after 5 years.

180 patients had cardiac pain at diagnosis. It was commoner in females aged less than 50 and carried a relatively good prognosis: 46% of the patients survived 5 years, and 16% survived 20 years. The mean survival of all those who died was 56 months from the date of diagnosis.

111 patients had heart-failure at diagnosis. It was commoner in males and older patients and carried a bad

prognosis: only 15% of the patients survived 5 years. The mean survival of those who died was only 18 months from the date of diagnosis.

The diastolic blood-pressure was a good index of prognosis.

In untreated patients the E.S.R. was raised in 80% of patients without congestive heart-failure and in 64% of patients with congestive heart-failure. The mean E.S.R. before treatment was 32 mm. and after penicillin 13 mm. There was some evidence that an E.S.R. above 50 mm. was a bad prognostic sign.

Calcification of the ascending aorta was noted in 35% of 64 radiographs personally examined. It was commoner in elderly patients.

After the exclusion of patients dying within a year of diagnosis, patients with heart-failure, asymptomatic patients, and patients aged more than 60 years, the mean survival of the patients who died was increased from 100 to 151 months by intensive treatment with arsenic and/or bismuth; after 10 years 60% of the "fully treated" group survived, compared with only 31% of the "inadequately treated" group. This difference is statistically significant.

Many of the patients treated with penicillin are still alive. Conclusions in the present series must be regarded as provisional only. There was no evidence that patients treated with penicillin and either arsenic or bismuth had a better prognosis than patients fully treated with either arsenic or bismuth alone. Patients treated with penicillin alone, however, appeared to have a slightly poorer prognosis.

It is therefore recommended that, on the information at present available, patients should receive at least one full course of either arsenic or bismuth and a full course of penicillin.

We wish to thank Dr. Maurice Campbell, Dr. Evan Bedford, Dr. Paul Wood, Dr. William Evans, Dr. Graham Hayward, Dr. Wallace Brigden, Dr. Kenneth Latter, Dr. Wilfrid Oliver, and Dr. James Campbell for permission to study patients under their care; Dr. Bedford, Dr. Wood, and Dr. Evans for their valuable criticism of this paper; Dr. Peter Kerley, Mr. Ambrose King, and Mr. J. A. Heady for much helpful advice; and the many general practitioners who kindly gave us information about their patients.

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DISCREPANCIES IN THE ERYTHROCYTE-SEDIMENTATION TEST IN RHEUMATIC FEVER

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THE reproducibility of the erythrocyte-sedimentation (E.S.R.) test was examined by Wintrobe and Landsberg (1935) in 9 cases (diagnosis not stated). The greatest standard deviation observed in multiple tubes containing similar oxalated blood was less than 1 mm., and Wintrobe and Landsberg concluded that E.S.R.s may be considered to be significantly different when their difference is greater than 2 mm.

For a year E.S.R.s in this unit have been determined by two methods, each done in duplicate. The degree of agreement in each pair of tubes was much less satisfactory than that noted by Wintrobe and Landsberg.

TABLE I—E.S.R. AT INITIAL EXAMINATION OF BLOOD

Case no.	Arithmetical difference between duplicates (mm.)		E.S.R. (Westergren) (mm. in 1 hr.)
	Heparinised blood	Citrated blood	
1	0	3	42
2	2	0	16
3	1	10	105
4	0	2	43
5	5	0	48
6	6	0	70
7	0	0	70
8	2	0	50
9	0	0	55
10	0	0	18
11	5	0	122
12	2	0	43
13	0	0	71
14	0	0	80
15	11	1	126
16	6	1	58
17	7	1	32
18	7	0	62
19	0	0	8
20	4	2	56
21	0	0	72
22	12	3	100
23	2	0	67
24	0	2	18
25	11	1	52
26	9	2	32
27	3	5	63
28	42	1	67
29	5	2	38
31	12	1	39
32	12	0	117
33	1	1	71
34	2	6	79
35	11	3	99
36	2	1	31
37	7	3	71
38	36	11	84
39	9	0	29
40	0	1	7
41	3	1	28
42	1	0	90
43	0	0	8
44	17	1	81
45	2	3	83
46	1	0	12
47	6	0	73
48	47	0	116
49	3	0	127
50	12	1	64
51	0	1	54
52	9	2	84
53	20	0	38
54	1	1	100
55	0	1	10
56	35	2	85
57	20	2	63
58	11	1	92
59	35	0	103
60	3	0	41

The sample of blood from case 30 was lost by accident.

Methods

60 consecutive patients admitted with either acute or subacute rheumatic fever were studied. After an initial examination of their blood treatment was started, usually with aspirin. Their blood was examined again on the fourth day of treatment, on completion of a week's treatment, and thereafter weekly.

Blood was collected by venepuncture. A syringe containing 1 ml. of 3·8% sodium-citrate solution was filled to the 5-ml. mark with blood; then the syringe was disconnected (the needle remaining in the vein), and 5 ml. of blood was allowed to flow from the needle into a small siliconed container. The bottom of the container was covered by a film of dried heparin (250 units). Each sample of blood was used to fill two Westergren sedimentation tubes. Thus of the two methods used for sedimentation tests the first corresponded to that described by Westergren (1921), and the second was similar to the Westergren method except that the Westergren tube was filled with heparinised blood.

Tubes were set up within 1 hour of collection of blood; tubes of any pair were always placed side by side in the same rack. Readings were made at the end of 1 hour. Correct filling of the tubes and reading of the results were personally supervised by one of us.

TABLE II—SERIOUSLY DISCREPANT READINGS IN DUPLICATE ERYTHROCYTE-SEDIMENTATION TESTS

Case no.	E.S.R. (mm. in 1 hr.)				Fibrinogen (g. per 100 ml.)	P.C.V. (%)
	Heparinised blood		Citrated blood			
	Tube 1	Tube 2	Tube 1	Tube 2		
Initial examination:						
28	95	53	67	66	0·75	34
38	10	46	78	89	1·14	46
48	97	50	116	116	0·82	38
56	10	45	84	86	0·68	43
59	26	61	103	103	0·76	36
After 4 days' treatment:						
18*	106	83	83	82	0·78	37
32	58	101	103	102	0·82	36
36	82	59	68	70	0·67	40
44	68	47	80	80	0·87	38
58*	33	70	123	123	1·03	38
30	105	95	89	115	0·96	35
After 1—6 weeks' treatment:						
15	42	18	27	27	0·52	45
27	4	29	36	37	0·41	43
42*	95	47	130	130	0·63	35

* Cases in which the next or a later E.S.R. test showed a similar serious discrepancy (more than 20 mm.).

The remainder of the heparinised specimen was used to determine the packed-cell volume (P.C.V) and the plasma-fibrinogen level. The gravimetric method of Foster and Whipple (1922), with minor modification, was used for estimating the fibrinogen level.

Results

Readings at the initial examination of blood are shown in table I. The first column shows the difference between the two sedimentation tubes filled with heparinised blood; the second column the difference between the two tubes filled with citrated blood; and the third column the E.S.R. (Westergren) (mean of the two tests). The average arithmetical difference between the readings of the duplicates containing heparinised blood was 7·8 mm., and citrated blood 1·3 mm.

Coincidentally with improvement in the rheumatic state and fall of the plasma-fibrinogen level the discrepancies between the readings of duplicates became smaller and less numerous.

A serious difference (more than 20 mm.) between the readings of a pair of tubes containing similar heparinised blood was noted in 13 patients (table II). These major discrepancies were rare except during the week following admission. In cases 18, 42, and 58 major discrepancies were found at two separate examinations. In the remaining 10 patients though inconsistencies were noted at later examinations they did not reach 20 mm. of difference.

TABLE III—MULTIPLE E.S.R. FOUND BY THREE METHODS OF TREATING BLOOD OBTAINED AT THE SAME VENEPUNCTURE

Case no.	E.S.R. (mm. in 1 hr.)											
	Heparinised blood				Citrated blood				Diluted heparinised blood			
	Tube 1	Tube 2	Tube 3	Tube 4	Tube 1	Tube 2	Tube 3	Tube 4	Tube 1	Tube 2	Tube 3	Tube 4
57	46	72	48	75	64	64	64	62	74	73	73	73
59	26	61	52	73	103	103	100	102	115	115	117	110
60	35	23	29	37	43	46	46	46	44	42	42	..

There was only 1 instance (case 30) of a serious difference between the readings of a pair of tubes filled with similar citrated blood (table II).

Careful inspection did not show any abnormality of sedimentation. Thus, when a serious difference existed between the readings of a pair of tubes, rather large cell aggregates formed and fell rapidly in one tube, while in the other the cell aggregates were smaller and the period of aggregation more prolonged.

Discussion

These results imply that E.S.R. tests with heparinised blood are not infrequently misleading when used to follow the course of rheumatic fever.

The possibility that the discrepancies found were due to some unsatisfactory feature in technique must first be considered. The results were examined to see whether the first tube filled tended to show either a higher or a lower E.S.R. from that of the second tube; but there was no such trend (table II). Tubes of any pair were set up side by side in the same rack and were therefore exposed to the same extraneous physical factors (e.g., temperature). A pair of tubes and their contents would be identical, provided that the specimen had been properly mixed before the tubes were filled. To test this the blood was collected from each tube after the reading at 1 hour, and its P.C.V. was determined. This was done on 11 occasions when there was a serious difference between the readings of a pair of tubes, and proved that mixing had been satisfactory in all 11 cases.

When 10 mg. of oxalate per 5 ml. of blood was used as anticoagulant, Wintrobe and Landsberg (1935) found that the E.S.R. did not differ significantly from that of heparinised blood. It therefore seemed likely that, if heparinised blood showed inconsistent sedimentation, oxalated blood would do so too. In 2 cases in which a

TABLE IV—E.S.R. IN BLOOD OF PATIENT AGED 24 WITH GONOCOCCAL ARTHRITIS

December	E.S.R. (mm. in 1 hr.)							
	Heparinised blood				Citrated blood			
	Tube 1	Tube 2	Tube 3	Tube 4	Tube 1	Tube 2	Tube 3	Tube 4
17	76	61	76	110	..	..	..	..
21	115	117	100	98	..	..	..	..
28	93	78	57	97	..	..	..	..
29	83	107	97	..	85	81	82	..
30	50	45	75	77	85	85	85	84
	40*	77*	38*	55*	..	..	..	..

Heparin 50 units per 5 ml. of blood was used except for values marked * where 150 units per 5 ml. blood was used. On each occasion tubes 1, 2, 3, and 4, in that order, were filled from the same sample of blood and placed in the same rack.

serious discrepancy was noted between the readings of sedimentation tubes containing heparinised blood another 5 ml. of blood was obtained and collected in the oxalate mixture of Heller and Paul (1934). From each oxalated specimen four Westergren tubes were filled; the readings at 1 hour were 34, 17, 35, and 55 mm., and 58, 114, 108, and 61 mm.

The column of blood in the Wintrobe tube is identical with that in the Westergren tube except that it is half the length (100 mm. instead of 200 mm.). In the shorter (Wintrobe) tube maximal sedimentation (due to packing) occurs more rapidly, and discrepancies at 1 hour would probably be less common than in Westergren tubes. Therefore the frequency with which the classical Wintrobe method would show a lack of reproducibility cannot be inferred from the present results.

The question whether the more reproducible results obtained with citrated blood were due to the effect of dilution or to the citrate ion was investigated, and it was concluded that dilution was the important factor. In 3 cases multiple sedimentation tubes were filled with heparinised blood, citrated blood, and heparinised blood diluted with physiological saline solution (1 ml. of saline solution to 4 ml. of blood), all the blood having been obtained at the same venepuncture. The results appear in table III.

Of the present 60 patients with rheumatic fever 14 had a grossly inconsistent E.S.R. at some stage of their illness. This was found by setting up duplicate tubes; so the true incidence is almost certainly higher. For example, in 1 case four tubes containing blood from the same sample showed readings (as mentioned above) of 34, 17, 35, and 55 mm. Since six different pairs of these four tubes can be set up and only one pair agree, the chance of agreement is 1 in 6 (17%). Additional tubes from the same sample of blood might change that chance.

Results obtained in a patient with gonococcal arthritis (table IV) indicate that inconsistency in the E.S.R. is not confined to patients with rheumatic fever.

Summary

In following the course of rheumatic fever E.S.R. tests made with either heparinised or oxalated blood may be seriously misleading, results being obtained which are not reproducible.

Repeated E.S.R. tests were made both with citrated and with heparinised blood in 60 patients with rheumatic fever.

In 13 patients (22%) there was at some stage in the disease a serious difference (more than 20 mm.) between the readings of duplicate Westergren sedimentation tubes filled from the same heparinised sample of blood.

Discrepancies persisted when oxalated blood was used instead of heparinised blood.

In the shorter Wintrobe tube discrepancies would probably be less common (owing to earlier packing) than in the longer Westergren tube; therefore the frequency with which the classical Wintrobe method shows discrepancies cannot be inferred from the present results.

In case 30 there was on one occasion a serious difference between the readings of a pair of tubes filled with citrated blood. The more reproducible sedimentation of citrated blood seems to depend on dilution and not on the presence of citrate ions.

Serious discrepancies between the readings of duplicate E.S.R. tests are not confined to patients with rheumatic fever; they were found in a patient with gonococcal arthritis.

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TREATMENT OF POST-HERPETIC NEURALGIA*

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PAIN is a subject of absorbing interest, but many patients with chronic pain are difficult people to assess, and the neurologist may feel justified in introducing some guile into his programme of cure. Pain thresholds can be influenced by so many factors that he should at times be prepared to embark on what might be termed a game of bluff with his patients' higher cerebral mechanisms. Thus he should not despise building up a certain atmosphere of the miraculous around his pain clinic, for this introduces a desirable physiological influence at a most important level.

Among the more difficult varieties of chronic pain is post-herpetic neuralgia, which develops in about one case in ten of herpes zoster. This complication cannot be correlated with the severity of the illness, but is much more likely in the elderly—the patients usually being over the age of 60, and often over 70.

The pain seems to be a continuation of the discomfort felt before the rash appeared, and the patients may become demoralised by it. It is arguable that all such patients have a low pain threshold; and for their excessive suffering we may, if we so wish, blame their parents, who during their early years failed to establish a healthy indifference to minor traumata and other painful states! However, these patients cannot be treated successfully by psycho-analysis.

What we loosely term the psychogenic factor is a physiological process which is interfered with by frontal lobectomy. Beecher (1956) calls it "the processing" of the pain mechanism. It is a personal matter, and, as it is liable to take charge of the clinical picture if the pain continues for long, we should make a plea for intensive treatment, preferably with admission to hospital, within a very few weeks of the pain developing. The elderly patient who has had severe pain for 5 or 10 years is not easy to deal with.

Post-herpetic neuralgia resembles causalgia, which is associated, for example, with a partial lesion of a sensory nerve. All who have experience of nerve injuries know the importance of full activity of the affected part if causalgia is to be avoided, and, in the same way, causalgia after herpes zoster is commoner in those who sit at home, doing little but nursing and protecting the sensitive area. This is a common but fundamental mistake in dealing with any such pain, and we find that as soon as the rash is healed the affected tissues should be moved freely, and the scarred area rubbed. General exercises help. It is probable that the higher prevalence of pain in the elderly is correlated more with their inactivity than with their age. We have all visited these sufferers in their homes, where, in a stuffy room, the patient sits crouching beside a fire, brooding over her pain. And we shall do well in these circumstances to remove her from the unhealthy environment to the matter-of-fact atmosphere of a hospital ward. For, although successful

* Based on a communication to the Association of British Neurologists, Nov. 16, 1956.

treatment usually depends more on physical than on psychological procedures, success breeds success in the treatment of chronic pain, and our results now seem to be so good, that the patient, soon after admission, comes to feel that it is just a matter of time before the nerves responsible are brought under control. Among the many whose pain has a genuine physical basis, there are a few hysterics who are determined to make as much fuss as possible, and for them the concentrated treatment introduces a valuable element of discipline: their symptom, which was once a protection, becomes a liability, so they cast it aside.

Material and Methods

The present study concerns a hundred cases of post-herpetic neuralgia seen during the past 10 years or so—fifty referred to our neurosurgical colleagues and fifty referred to our neurological unit. The average age in both groups was 66 years, and 60% were women. In thirty-two of the surgical group, the trigeminal nerve area was affected, but in our group the number was twenty-three.

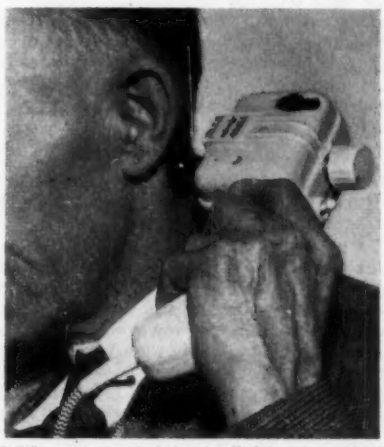
The surgical group was somewhat negative from the therapeutic point of view, because surgery or alcohol nerve-block was generally (and very wisely) avoided; but in recent years most of the medical patients have been admitted to hospital and submitted to concentrated treatment of one kind or another, with results which are so encouraging that we have come to look forward to admitting patients with post-herpetic neuralgia. Certainly, our results are improving with experience.

As has already been mentioned, the type of pain in these cases is one which is associated with a partial lesion of a peripheral nerve, and has features similar to those observed in causalgia. There is a raised threshold to some forms of sensation, and, indeed, there may be complete anæsthesia of the scarred area (especially when the first division of the trigeminal nerve is involved). Often, however, there is also some hyperæsthesia in the scarred area, or at the edge which is overlapped by adjacent nerves (Weddell et al. 1948). It has become evident that when hyperæsthesia is a prominent feature, the chances of cure are specially good.

It is quite easy to remove the hyperæsthesia temporarily by blocking nerves or infiltrating the skin with procaine, and it is important to study, without delay, the effect of this procedure on the spontaneous pain. In many instances this simple procedure gives remarkable relief for several hours, and frequent repetition of the procaine block often leads to increasing periods of freedom until relief may be permanent and the affected area no longer hyperæsthetic. Procaine block of the nerves supplying the skin adjacent to the scarred area may be specially important. Thus in ophthalmic herpes, block of the occipital nerves on the side involved may be beneficial, as well as the supratrochlear and supraorbital nerves on the opposite side.

Hyperæsthesia can be abolished also by a mechanical vibrator. It still does not seem to be widely known that a vibrator with a vulcanite applicator, held lightly on a hyperæsthetic area for 5–10 minutes, acts as a local anæsthetic, without the trauma of a needle, and removes cutaneous hyperæsthesia. It does the same with a tender scar. We used these appliances first for percussing neuromata in amputation stumps (Russell and Spalding 1950), and we now use them freely in the hospital ward, and when necessary lend them to the patients to take home. Resting the sensitive area on a hard surface for half an hour has, by the action of direct pressure, a similar effect in removing hyperæsthesia, and is especially useful where the trunk dermatomes are affected.

Thus, if there are areas of hyperæsthesia, remarkable benefit is derived from the removal of this sensitivity. Presumably the nerve-fibres concerned with firing hyper-



Vibrator ('Pifco massager') being applied by the patient (case 4) to the suboccipital region, for its local anæsthetic effect.

pathic sensations are very easily traumatised into inactivity by a vibrator.

This effect, although only temporary at first, on repetition soon becomes longer-lasting and eventually permanent. The relief often provided by the removal of hyperæsthesia shows that, whatever the lesion is in the posterior-root ganglia, this is not where the distressing afferent impulses originate. It is natural that, as the pain is relieved, the patient's confidence in the result of the treatment rises, and this improves matters still further. Whichever method is used, repeated treatments are followed by disappearance of the hyperæsthesia, and this commonly leads to striking relief of spontaneous pain.

This removal of all hyperæsthesia from the scarred and the adjacent areas may be the only treatment required, but sometimes pain persists and further steps are necessary.

One of the most useful of these is to observe the effect of interspinous hypertonic saline, 0·4 ml. of 6% saline being injected near the segment affected (Kellgren 1939). This may aggravate the pain temporarily, but may then be followed by relief for several hours. When the face is involved, suboccipital injection is often surprisingly appropriate. The ligamentous tissue into which these hypertonic saline injections are given lies only a short distance under the skin—deep injections are not given, and indeed might be dangerous.

The ophthalmic cases may be difficult, and it may be helpful to shave the hair well clear of the anæsthetic zone, to give access to the adjacent areas. Unlike the patient with *tic douloureux*, who will submit to anything, these patients may refuse to have their hair cut—"it's not so bad as all that."

Other methods, such as locally applied galvanism, procaine ionisation, sympathetic nerve-block, and skeletal traction, may all be useful in certain circumstances. In general, it is desirable to follow one treatment quickly with another, especially in the more difficult cases. Some positive local action of a physical type, several times daily, may be desirable.

We have no experience of extensive skin-flap reflection, as advocated by Abbott and Martin (1951) and others, but this should be very successful if the flap includes a strip outside the scarred area, supplied by adjacent nerves. In our opinion, X-ray therapy and alcohol nerve-block should not be used in the treatment of herpes zoster at any stage. X-irradiation often makes matters worse in the chronic stage, and seems undesirable in the acute

stage, because it helps neurotropic viruses to invade the nervous system. Nerve-root section and alcohol nerve-block also do not seem to us to be desirable for these cases. Operations on the pain-tracts of the spinal cord are unlikely to give relief, while frontal-lobe operations are an indication of defeat which we have so far avoided.

Results

Patients seen within a few weeks of the acute stage are naturally the easiest to deal with, but even those who have suffered for many years respond to a determined attack " from all sides."

It is clear from follow-up studies that the great majority of the patients treated in recent years have been considerably relieved, and in some a spectacular cure has been achieved. However, the methods used have been improving steadily and it seems more helpful to describe the treatment given to the last few patients treated. They have not yet been followed for long, but with good early results there is generally some lasting relief.

The following are the last five cases whose treatment has been completed.

Case-reports

Case 1.—A woman aged 64 developed ophthalmic herpes on the right side on Oct. 22, 1955, and was admitted for 10 days to the Oxford Eye Hospital, where aureomycin was given. After this illness, she complained of severe right frontal pain, and became irritable, depressed, and sleepless. For this, many drugs, including pethidine, were prescribed, but no local treatment was given. 2 months later, there was severe hyperæsthesia in the scarred area, which she had not dared to touch or wash on this account. There was scarring in the right frontal region, along with keratitis and periorbital œdema. In the scarred area, there was a mixture of sensory loss and marked hyperpathia. She was depressed and miserable.

The patient was admitted to Stoke Mandeville on Jan. 6, 1956, and a vigorous policy was adopted of shampooing the scarred area and repeated massage with olive oil, along with local treatment for the ocular inflammation. The frontal area was massaged for 10–15 minutes three or four times daily. There was considerable osteo-arthritis of the cervical spine, and periods of neck-traction (6 lb.) while she was lying in bed added considerably to her comfort. These simple measures were followed by remarkable relief and improvement in morale. She was discharged on Jan. 25, and 6 months later her condition was reported to have improved steadily since she left hospital.

Case 2.—A man aged 46 developed herpes zoster in the right occipital region in August, 1955. After this, there was persistent pain in the affected area with frequent sharp spasms of severe neuralgia. He was admitted to Stoke Mandeville Hospital on Jan. 20, 1956, and the only abnormality was marked tenderness over the scarred area. Vigorous local massage was begun without delay. On one occasion, 0·3 ml. of 6% saline was injected into the interspinous ligament between the spines of the 2nd and 3rd cervical vertebræ; the pain was reproduced in the scarred area for 5 minutes, but then disappeared for several hours. Treatment was then continued with a mechanical vibrator and massage to the sensitive area, each being applied three times a day for 10–15 minutes. When he was discharged on Feb. 2, the pain had all but disappeared, but he was supplied with a vibrator to use at home. Seen on Oct. 20 he had remained comfortable, except for some short periods of pain lasting 5–10 minutes once a day. It was not considered necessary to readmit him.

Case 3.—A man aged 71 developed ophthalmic herpes zoster on the left side in November, 1952. Since then, he had had continuous pain in the left half of his scalp " as though a nail were being driven through my head." Treatment with chlorpromazine and injections of vitamin B_1 (aneurine hydrochloride) and B_{12} (cyanocobalamin) had failed to give relief. When he was admitted to Stoke Mandeville Hospital on June 20, 1956, there was considerable scarring and some anæsthesia of the scalp in the left frontal region with a very tender area over the left eyebrow: the frontal pain was also aggravated by pressure on the upper alveolar margin where two teeth had been extracted 2 years previously.

Procaine block of the left supra-orbital, auriculotemporal, and greater occipital nerves abolished the pain for the first time since its onset: the sensitivity of the alveolar margin also disappeared. He was then encouraged to apply a mechanical vibrator to the sensitive areas for 10 minutes every 2 hours while he was in hospital until his discharge on July 2. During this time he had no return of pain, but it returned 2 weeks after discharge—he had stopped treatment owing to pressure of work, but he was not prepared to come into hospital again until he had more spare time. It is obviously desirable that a further period of intensive local treatment should be given.

Case 4.—A man aged 60, when first seen in July, 1950, had had severe ophthalmic herpes zoster a year previously. Since then there had been a severe pain in the left frontal region, which was heavily scarred. He had a hyperæsthetic zone over the upper edge of the scarred area, and tapping here caused a shooting pain above the left eyebrow. He was first advised to press firmly with the wooden handle of a clothes-brush over the sensitive zone for 10 minutes three times daily, and this gave considerable relief. He also found that resting the sensitive frontal region on a table for 10 minutes had a relieving effect, and during the succeeding 5 years there was a steady tendency to improvement, provided he continued to apply local pressure as a numbing agent.

He was, however, admitted to Stoke Mandeville Hospital on Sept. 29, 1956, to see whether more could be done, for some pain had now spread to the suboccipital region on the left side. This discomfort was relieved by injecting procaine into the left suboccipital muscles, and the long-standing discomfort was abolished for 8 hours by blocking the supra-orbital, supratrochlear and auriculotemporal nerves. These injections were repeated two or three times, and the temporary relief was prolonged by using a mechanical vibrator which was provided for him to take home.

Case 5.—A woman aged 80 developed herpes zoster in the left mid-thoracic zone in June, 1955, and complained of persistent severe pain in the scarred area. There was also marked hyperæsthesia.

She was admitted to Stoke Mandeville Hospital on Oct. 27, 1956, and daily procaine blocks to the sensitive intercostal areas were given for 3 days. Local massage was given frequently, and procaine by ionisation was applied twice daily for a week over the whole sensitive area. After some further procaine nerve-blocks, the hyperpathia almost disappeared and could be further relieved by vigorous massage which she was encouraged to apply herself several times a day.

Discussion

These case-records indicate that the first thing to do is to institute vigorous local treatment of one kind or another, and to combine this with local anæsthetic procedures, of which the mechanical vibrator is the most useful, for it can be applied by the patient himself as often as required.

Some of our methods are probably having some effect by providing competing stimuli to the thalamus as well as by actually blocking afferent discharges. However, in these cases it is important to use every trick of thalamic distraction one can think of. Thus a competing stimulus may well explain the effect of counter-irritation, or the remarkable relief, in some cases of causalgia, when cold is applied. The electrical treatment of neuralgia, so much used 50 years ago, may have a similar basis. In any case, it is clear that this wide approach to the problem of pain, however " organic " it may be, is well worth while.

The methods described here are clearly applicable to many other forms of intractable pain, as has already been reported by Fischer-Williams (1956).

Summary

A hundred cases of post-herpetic neuralgia are considered, and the problems of treatment discussed.

Post-herpetic neuralgia can usually be relieved by concentrated treatment to reduce pain thresholds in the tissues adjacent to the scarred area.

The removal of hyperæsthetic zones is important, and for this the repeated use of procaine nerve-block, and of a mechanical vibrator, are specially valuable.

The methods used in treating five recent cases are described.

We are indebted to Mr. J. P. Pennybacker for permission to refer to patients under his care.

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A DIET RESTRICTED IN REFINED CEREALS AND SATURATED FATS: ITS EFFECT ON THE SERUM-LIPID LEVEL OF ATHEROSCLEROTIC PATIENTS

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IN parts of the world where atherosclerosis is common, the quality and quantity of the diet of the majority of the population differ significantly from those in countries where the disease is rare. Atheroma may possibly be caused by a high intake of: cholesterol, fat, calories, saturated fats (with relative deficiency of essential fatty acids), and degerminated carbohydrates (with deficiencies of vitamins and minerals) (Van Handel 1955).

Lowering of serum-cholesterol by a diet low in lipids has been reported by Keys (1952). Morrison (1955), similarly, used for atherosclerotic patients a low-lipid diet supplemented with wheat-germ. Groen et al. (1952) reported a fall in serum-cholesterol in normal volunteers on vegetable diets, while Kinsell et al. (1953) and Beveridge et al. (1955) found that the serum-cholesterol was lowered by a high intake of certain oils which are rich in essential fatty acids. The work of Bronte-Stewart et al. (1956) confirms that in short-term feeding experiments the serum-cholesterol level is related to the source of the fat consumed. An interesting new finding was the cholesterol-depressing action of highly unsaturated marine oils.

In the past 3 years we have routinely treated atherosclerotic patients with low-fat diets—i.e., diets in which less than 20% of the total calories is derived from fat. These diets reduced serum-lipids in some cases but were without effect in others, or occasionally even raised the serum-cholesterol. Furthermore, the majority of patients became mentally depressed and physically weak during severe fat-restriction (unpublished observations).

Therefore it was decided to abandon the low-fat diet, but to restrict added fat to unsaturated soybean oil. Legumes were added to provide a rich source of magnesium, manganese, copper, and B vitamins, including choline. Peanuts and soybean flour provide additional unsaturated fats. Soybean products play an important rôle in the diet of most Oriental peoples. A detailed discussion of the composition and the possible value of these food items in the prevention of atherosclerosis was published earlier (Van Handel 1955). The present study reports the effect of this new regimen on the serum cholesterol and phospholipid levels.

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TABLE I—PATIENTS WITH INITIAL SERUM-CHOLESTEROL BELOW 250 MG. PER 100 ML.

—	Serum-cholesterol (mg. per 100 ml.)			Serum-phospholipids (mg. per 100 ml.)		
	Highest	Lowest	Average	Highest	Lowest	Average
Initial ..	250	160	215	280	175	240
Final ..	270	152	215	290	180	240

Methods

Estimations

Serum was extracted with Bloor's mixture. Cholesterol was determined by the method of Fidler (1934) and lipid phosphorus by dry ashing with magnesium oxide (Van Handel 1954). Phosphorus was estimated by the method of Fiske and Subbarow (1925).

The Diet

Not allowed.—Lard and other animal fats, shortening, white bread, and foods made from degerminated flour and cereals.

Restricted.—Margarine and butter to 25 g. a day.

Allowed ad lib.—Whole-wheat bread, liquid soybean oil as cooking-fat, lean meat, milk, cheese, and eggs.

Obligatory daily supplement.—2–3 g. of soy lecithin (the approximate amount which is lost in the degumming of 100 g. of soybean oil), 25–50 g. peanuts, 25–50 g. peas or beans, and 25–50 g. 'Nurupan' (whole soybean flour).

Thirty-four patients followed the diet for periods ranging from 30 to 360 days. Ten of them had been treated with a low-fat diet for from 3 months to several years before changing to this regimen. All had previously shown clinical signs of coronary insufficiency, with or without myocardial infarction. About half the patients were admitted to hospital for a period of 4 to 12 weeks. Observations could then be made while they were under strict dietary control. Of course, it is much more difficult to maintain control in outpatients, but a number of patients who did not follow the diet consistently have been excluded from this report.

Results

In a group of sixteen patients with initial serum-cholesterol levels under 250 mg. per 100 ml., the diet had no significant effect (table I). The change of serum-cholesterol was 0–10%. They took the diet for 30–360 days (average 160).

TABLE II—PATIENTS WITH INITIAL SERUM-CHOLESTEROL ABOVE 235 MG. PER 100 ML.

—	Serum-cholesterol (mg. per 100 ml.)			Serum-phospholipids (mg. per 100 ml.)		
	Highest	Lowest	Average	Highest	Lowest	Average
Initial ..	400	235	300	380	220	290
Final ..	250	172	228	282	180	250

Six of these sixteen had been taking a low-fat diet for 90–300 days before they were transferred to the experimental diet. This change did not cause a rise of serum-lipids.

Fourteen patients with initial levels of cholesterol over 235 mg. per 100 ml. showed a steady decrease in serum-cholesterol (table II). They took the diet for 30–330 days (average 110). Four of these fourteen had previously been treated with a low-fat diet and had maintained their high serum-cholesterol during this period.

Some typical data in a few patients, who responded well to the diet, are presented in detail in table III.

Discussion

The present study was undertaken to evaluate the effect of a regimen low in saturated fatty acids and degerminated carbohydrates on patients with clinical

TABLE III—SOME TYPICAL GOOD RESULTS. IN THE PERIOD MARKED " L " THE PATIENT WAS TAKING A LOW-FAT DIET

Patient	Day of experiment	Cholesterol (mg. per 100 ml.)	Phospholipids (mg. per 100 ml.)
Man aged 51	0	400	380
	30	350	292
	45	310	275
	75	260	265
	100	240	250
Man aged 58	−200 } L	307	..
	0 } L	300	250
	50	230	220
	100	220	240
	200	220	220
	332	232	240
Woman aged 55	0	314	320
	45	277	275
	80	255	260
	110	227	260
Woman aged 58	0	275	280
	80	223	236
	200	215	225
	300	200	220

atherosclerosis. The patients did not object to the substitution of soybean oil for solid fats. In most cases the whole family changed over to soybean oil as the source of cooking-fat. Soybean flour was incorporated in several dishes such as soup, biscuits, and breakfast cereal, but some patients preferred to take it in a glass of milk or water. Not only those who were previously kept on diets very low in fat, but also the patients who had not previously followed a special diet, showed noteworthy improvement of disposition and of the ability to perform normal activities. Though no patient died, it would be premature to draw clinical conclusions, for we had no controls.

A steady drop of serum-cholesterol was achieved and maintained during the many months of observation, but only when the initial values were high. A considerable number of our clearly atherosclerotic patients, on free diets, had serum-cholesterols between 160 and 250 mg. per 100 ml. The blood-lipids of these did not change significantly on the experimental diet.

The value attached to cholesterol-depressing diets is closely connected with the common belief that the lipids in atheromatous deposits derive from the plasma, but there is no strong experimental evidence for this assumption. The alleged atherogenic effects of fats in general, and of highly saturated fats (without cholesterol supplements) in particular, have not been confirmed by clear-cut experiments. In Java, where the highly saturated coconut oil is the main source of cooking-fat, the incidence of clinical atherosclerosis is very low (deLangen 1935). To investigate whether saturated fats play a rôle in atherogenesis, data from such countries as France and Argentina, where the consumption of meat and dairy products is large and where unsaturated oils are used for cooking, should be compared with similar data from (non-Western) areas where coconut oil is the main source of cooking-fat.

It is unlikely that a diet which merely substitutes unsaturated for saturated fats can prevent atherosclerosis; therefore our tentative diet includes other factors in addition to essential fatty acids.

Our results are compatible with the hypothesis that high blood-lipids in atherosclerosis are caused or maintained by deficiencies in Western staple food.

Summary

A diet restricting animal fats and degerminated flour, and with supplements of soy lecithin, soybean oil and flour, peanuts, and peas or beans, was successful in lowering the serum-lipids in atherosclerotic patients where they had previously been high.

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HYPERNATRÆMIA AND HYPERCHLORÆMIA IN BULBAR POLIOMYELITIS

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THE association of high serum-sodium and serum-chlorine levels with scanty urinary excretion of sodium and chlorine is rare. The commonest cause is severe dehydration, as in some cases of diabetic coma and in enteritis of infants; in most of these the condition is only temporary, and excretion of sodium and chlorine begins again as soon as the dehydration is overcome.

In 1939 I observed 5 cases of hyperchloræmia and hypernatræmia associated with minimal urinary excretion of sodium and chlorine in patients with intracranial lesions of various types (Allott 1939). Since then hyperelectrolytæmia has been described in association with various forms of intracranial lesions: after the removal of a craniopharyngioma (Peters 1948); in various lesions of the frontal lobes (Sweet et al. 1948); in a case of bilateral occlusion of the anterior cerebral arteries, a case of craniotomy for chromophobe adenoma, and a case of hemiplegia (McCarty and Cooper 1951); in cases of severe head injury (Higgins et al. 1951, 1954); in encephalopathy following sulphonamide therapy (Luetscher and Blackman 1943, Goodale and Kinney 1949); in a case of total pituitary hypofunction (Engstrom and Liebman 1953); and in cases of cerebral disease most of which were described as " encephalomalacia " (Schoolman et al. 1955). In many of the published cases observations were very limited, being confined in some of them merely to a single observation or to raised serum-electrolyte levels with no reference to urinary excretion.

I have recently had the opportunity, through the courtesy of Dr. J. P. Marsden, under whom the patients were admitted at Joyce Green Hospital, Dartford, of studying in detail two cases of poliomyelitis with cerebral involvement, one of which showed the full picture of hyperelectrolytæmia with suppression of the urinary excretion of sodium and chlorine, the other showing changes which may represent the early stages of this condition.

Both patients presented with severe bulbar poliomyelitis requiring artificial respiration with an intermittent positive-pressure machine; both initially passed normal volumes of urine but in the first few days developed severe oliguria, which proceeded to polyuria, the urine containing a high concentration of urea but a very low concentration of sodium and chlorine.

Case-reports

Case 1.—An electrical engineer, aged 28, was admitted on Dec. 3, 1955, with severe occipital headache, sweating, and photophobia. Six days before admission he had had an acute attack of diarrhœa lasting two days.

On admission he had neck rigidity, slight weakness of his legs, and blood-pressure 140/80 mm. Hg. Next day he was hoarse and had difficulty in coughing and weakness of his arms and legs.

Progress

On Dec. 5 his blood-pressure had risen to 195/90 mm. Hg, his bladder was distended, and 330 ml. of dark urine, withdrawn by catheter, was slightly acid and contained a trace of protein but no cells.

By Dec. 6 his breathing was difficult, tracheotomy was done, and a positive-pressure respirator was affixed. His general condition was poor, and during the day he had two attacks of cyanosis, the first being attributed to difficulty with the apparatus but the second to a cerebral vasomotor upset. His blood-pressure during these attacks fell temporarily to 80/30 mm. Hg.

From Dec. 6 to Dec. 8 his urinary output was very scanty —170, 140, and 240 ml., with intakes of 2300, 3000, and 3400 ml. of fluid, for the three days. His systolic blood-pressure during this time was 90–110 mm. Hg.

His urinary output increased from 1200 ml. on Dec. 9 to 5600 ml. on Dec. 13 and remained copious after this. His blood-pressure meanwhile was 170/110–190/120 mm. Hg. His urine remained acid and contained only a trace of protein, with a very few red cells and casts. By Dec. 16 his blood-pressure had returned to normal, and it remained thereafter about 130/90 mm. Hg.

His blood-urea level had remained high throughout in spite of apparently adequate urinary excretion, but his serum-electrolyte levels rose, with the onset of diuresis, to Na 169 m.eq. per litre, K 5·9 m.eq. per litre, Cl 130 m.eq. per litre, and HCO_3 24·8 m.eq. per litre on Dec. 17.

On Dec. 19 I was asked to see him because of these electrolyte abnormalities. He was now practically completely paralysed in all his limbs, there being only slight movements of his right hand and forearm, and respiratory distress was caused during brief interruptions necessary to adjust the respirator.

Chemical Observations (figs. 1–3)

Period I (*hyperchloræmic phase*).—From Dec. 14 to Dec. 29 there were high serum-electrolyte levels, with very scanty urinary excretion of sodium and chlorine. The blood-urea level was high, and the urinary urea concentration was also usually high—up to 3·5 g. per 100 ml. The intake of fluids (mostly by intragastric drip) was 3300–4500 ml. a day and the volume of urine usually 1500–2000 ml. a day. Until Dec. 16 the diet had consisted of milk and eggs, with various supplements, containing about 100 m.eq. of sodium, 60 m.eq. of potassium, and 50 g. of protein daily; but, because of the rising serum-electrolyte levels, a diet of fat and carbohydrate without electrolytes was given from Dec. 17, the total intake of fluids being kept at the same level. The blood-urea level had been falling, so 'Casilan' 50 g. and later 100 g. daily was added to the diet from Dec. 20 but stopped again on Dec. 28, when the blood-urea level rose. This rise was probably due to mersalyl (see below). Between Dec. 28 and Jan. 2, the serum-sodium and serum-chlorine levels fell and the blood-urea level returned to normal. This was associated with increased urea-clearance and the excretion of 48 g. and 56 g.

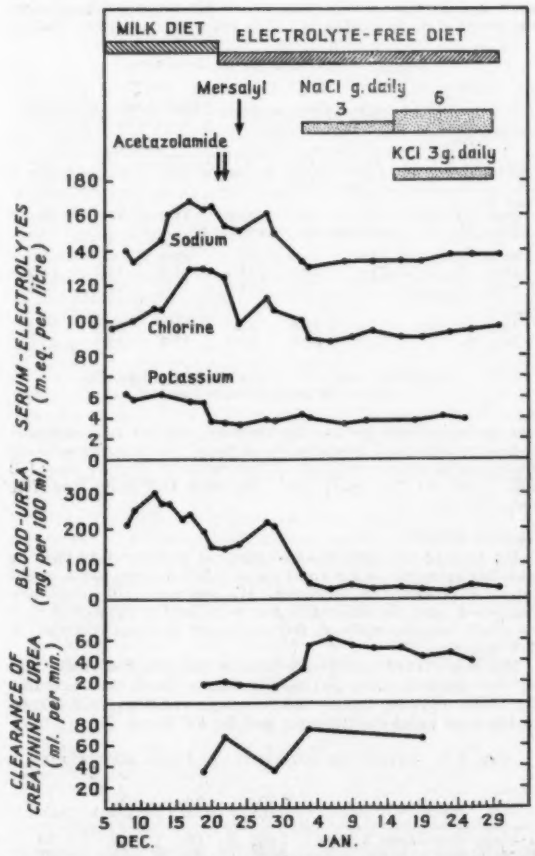

Fig. 1—Case 1: serum-electrolyte and blood-urea levels and clearance of urea and creatinine.

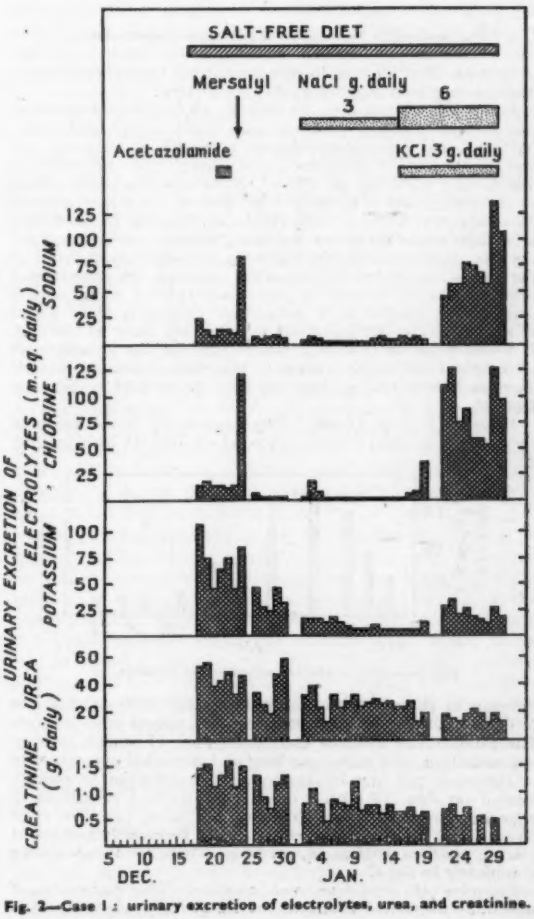

Fig. 2—Case 1: urinary excretion of electrolytes, urea, and creatinine.

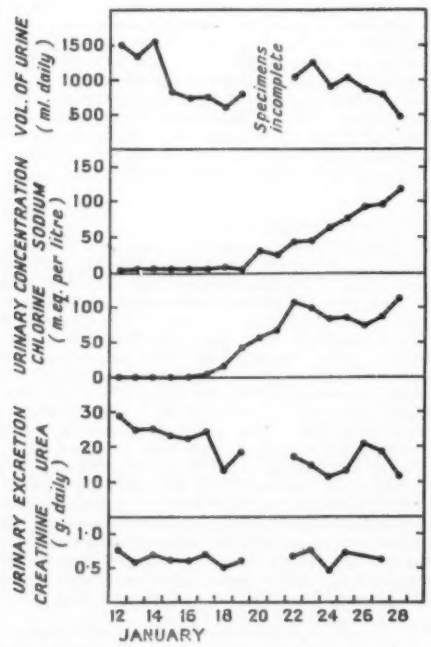

Fig. 3—Case I : resumption of excretion of electrolytes.

of urea on Dec. 29 and 30, the output for the previous three days having been only 33 g., 25 g., and 19 g.

Period II.—From Dec. 30 to Jan. 16 the blood-urea level was normal and the serum-sodium level (about 134 m.eq. per litre) and the serum-chlorine level (about 94 m.eq. per litre) on the low side of normal. The urinary urea concentration was usually 1·5–2·5 g. per 100 ml. Salts were cautiously added to the diet (NaCl 3 g. daily from Jan. 3, later increased to 6 g. daily, and KCl 3 g. daily from Jan. 15), but the excretion of sodium remained about 2–4 m.eq. daily ; and, except for the two days immediately following the addition of NaCl to the diet, when 18 and 8 m.eq. were excreted, the excretion of chlorine was too scanty to be measurable—1 m.eq. or less daily. The excretion of potassium decreased from about 45 m.eq. daily at the beginning to 3–4 m.eq. daily at the end. It seems possible that this period covered the greater part of removal of waste tissues ; the daily creatine output decreased from 1·65 g. daily on Dec. 29 to 0·32 g. daily on Jan. 17.

Period III (Jan. 17–28).—The resumption of excretion of electrolytes on Jan. 17 was preceded on Jan. 15 by a sudden

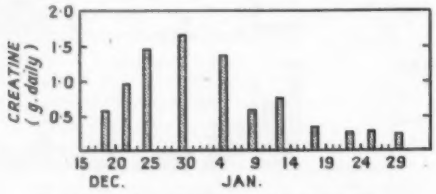

Fig. 4—Case I : urinary excretion of creatine.

decrease in volume of the urine from 1200–1500 ml. daily to 600–800 ml. daily without change in the output of creatinine. The excretion of chlorine started on Jan. 17 with a urinary concentration of 6 m.eq. per litre and increased continuously to 108 m.eq. per litre in six days. The excretion of sodium started on Jan. 18 with 9 m.eq. per litre and continued to increase somewhat more slowly to 120 m.eq. per litre after eleven days. The excretion of potassium increased from about 5 m.eq. per litre to 25 m.eq. per litre. These results are shown graphically in fig. 3.

Excretion of creatinine and creatine.—The excretion of creatinine fluctuated round about 1·2 g. daily when observations were started and gradually decreased, as muscle mass decreased, to a mean of about 0·7 g. daily by the end of the second month of illness. The excretion of creatine increased from 0·57 g. on the fifteenth day of illness to a maximum of 1·65 g. on the twenty-sixth day, and decreased to 0·32 g. daily at the end of the seventh week. The findings are shown in fig. 4.

Excretion of steroids.—The figures for the excretion of steroids are given in table I. The 17-ketogenic steroids and 17-hydroxycorticosteroids were determined by the methods of Appleby et al. (1955) ; the aldosterone was kindly estimated by Dr. I. H. Mills, of St. Thomas's Hospital, London. Although the first figures in both cases are above normal, they are probably not more than would be expected from the stress of the illness ; and, when the excretion of steroids is expressed as mg. per g. of creatinine (if this is justifiable in a patient with gradually diminishing excretion of creatinine), the values on Jan. 18, by which time the metabolism of Na and Cl had returned to normal, were at least as high as at the height of sodium retention. The aldosterone figure is definitely high : Dr. Mills gives up to 2 μg. daily as the upper limit of normal.

Effects of acetazolamide and mersalyl.—During the period of hyperelectrolytæmia the effects of acetazolamide and of mersalyl were investigated. Acetazolamide was given (250 mg. on Dec. 21 and 500 mg. on Dec. 22) without producing any change whatever in excretion of sodium and chlorine and producing only an insignificant change in excretion of potassium. Mersalyl 2 ml. on Dec. 24 increased the volume of urine from 1300 ml. to 2650 ml. and the excretion of sodium, chlorine, and potassium. The serum-chloride level fell during the mersalyl day from 125 to 98 m.eq. per litre. The effect of the mersalyl is shown in table II. The excess fluid excreted was definitely hypotonic compared with the serum, and the net effect was disadvantageous and to increase dehydration : the blood-urea level rose from 164 to 227 mg. per 100 ml. and the serum-sodium level from 152 to 161 m.eq. per litre. Before the mersalyl was given, the urinary sodium and chlorine concentrations had been low, 6–12 m.eq. per litre representing the range of concentrations. After mersalyl diuresis they fell still lower to 1–7 m.eq. per litre and 0–3 m.eq. per litre respectively.

TABLE I—EXCRETION OF STEROIDS

Date	Daily excretion (mg.)			Excretion expressed as mg. per g. of creatinine		
	17-K.S.	17-K.G.S.	17-O.H.C.S.	17-K.S.	17-K.G.S.	17-O.H.C.S.
Case 1 :						
Dec. 19, 1955	16·7	25·3	45·9	11·2	17·0	30·8
Dec. 21, ,,	Aldosterone = 4·5 μg.			..	..	..
Jan. 3, 1956	10·0	..	..	12·2	..	..
Jan. 9, ,,	11·3	13·6	14·2	8·9	10·7	11·2
Jan. 18, ,,	7·8	12·2	14·5	15·0	23·5	27·9
Case 2 :						
Jan. 18, 1956	25·6	32·6	45·7	21·0	26·9	37·8
Jan. 21, ,,	15·1	10·8	23·4	17·8	12·7	27·5

K.S., ketosteroids. K.G.S., ketogenic steroids.
O.H.C.S., hydroxycorticosteroids.

Clinical Progress

By Jan. 18 the patient had improved to the extent that he had fair strength in his right hand and forearm and a slight return of power in his left hand. His legs were still completely paralysed, and his respiration had recovered to the extent that he could breathe without the respirator without distress for 5–8 minutes.

His respiratory paralysis gradually improved slightly, and by the end of January he could breathe without the respirator for 45–60 minutes, but at this time he had little power except in his right hand and forearm and his left hand.

TABLE II—EFFECT OF MERSALYL ON DAILY EXCRETION

—	Water (ml.)	Na (m.eq.)	K (m.eq.)	Cl (m.eq.)
Average of previous 3 days	1480	10	59	14
Mersalyl day	2650	84	85	120
Excess due to mersalyl ..	1170	74	26	106

Case 2.—A woman, aged 40, was admitted on Jan. 13, 1956, with a week's history of backache, pains in the legs, and severe frontal headache. The day before admission she vomited several times and noticed weakness in both legs.

On admission she was fully conscious and coöperative, with blood-pressure 140/80 mm. Hg, nystagmus, weakness of her left arm, and paralysis of both legs. Her blood-urea level was 34 mg. per 100 ml., and her serum-electrolyte levels were normal.

Progress

Next day her left arm was completely paralysed, she developed severe dyspnœa, for which tracheotomy and an intermittent positive-pressure machine were needed, and her blood-pressure was 160/90 mm. Hg.

On Jan. 15 her blood-pressure was 100/80 mm. Hg and urinary output 1200 ml., but next day, with the same blood-pressure, the urinary output decreased to 60 ml. For the next three days she was semiconscious, with blood-pressure 100/80–130/80 mm. Hg, her daily urinary output increasing again to 430, 1640, and 1480 ml. After this her general condition deteriorated, her urinary output gradually diminished, and she died on Jan. 24 without fully recovering consciousness.

Chemical Findings

The blood-urea level rose from 39 mg. per 100 ml. on Jan. 14 to 310 mg. per 100 ml. on Jan. 20. The serum-electrolyte levels were still within normal range on Jan. 20 (Na 143 m.eq. per litre ; Cl 96 m.eq. per litre), but the electrolytes in the urine had decreased from Na 15–35 m.eq. per litre and Cl 6–10 m.eq. per litre during the first three days to Na 4 m.eq. per litre and Cl 0 on the sixth day. During the whole of her illness the urinary concentration of potassium remained high—35–79 m.eq. per litre during the first three days and 53 m.eq. per litre on the day before death. The urea concentration in the urine varied throughout from 1·2 to 1·85 g. per 100 ml.

Discussion

Lower-nephron nephrosis has been suggested by Schoolman et al. (1955) as a possible cause of this chemical syndrome, but the picture differs from the diuretic phase of lower-nephron nephrosis in nearly every respect ; in lower-nephron nephrosis the tubules have lost their concentrating power and manifest this by excretion of a near-glomerular filtrate, with a low urea concentration and usually a high electrolyte concentration. In complete contrast the present patients had a very high concentration of urea with a very low sodium and chlorine content of the urine, showing that there was excessive reabsorption of sodium and chlorine.

Dehydration

The simplest explanation of the chemical changes would be to regard the initial polyuria as an osmotic diuresis caused by the large amount of tissue-breakdown products to be excreted, thus leading to dehydration ; and to regard the absence of salt from the urine as due to salt deficiency ; but this explanation encounters many difficulties.

Many patients with hyperelectrolytæmia have been in coma, or with diminished thirst sensation, and Welt et al. (1952) have shown that dehydration is a common cause of the condition. In some of the many cases described by Schoolman et al. (1955) dehydration was probably responsible.

Although some dehydration was present and there was thirst during the hyperchloræmic phase, the present cases differ from cases of simple dehydration in the extremely scanty urinary excretion of Na and Cl. McCance et al. (1944), by simple dehydration in healthy persons, cut down the volume of urine from 1·34 ml. a minute to 0·43 ml. a minute with an increase in urinary urea from 1·04 to 3·98 g. per 100 ml. and an increase of urinary chloride from 86 to 219 m.eq. per litre. Nadal et al. (1941), by water deprivation in a person on a salt-deficient diet, found urinary chloride values of 35 and 19 m.eq. per litre ; only when gross salt deficiency was produced by intestinal suction in an already salt-deficient patient did the urinary sodium and chlorine fall to really low values, and this was associated with very low values of the electrolytes in the serum.

McCance et al. (1944) produced an osmotic diuresis in a dehydrated person by giving urea 35 g. intravenously ; the urinary sodium decreased from 125 to 17 m.eq. per litre as the urea increased from 2·9 to 4·8 g. per 100 ml. ; but this amount of urea is very much more than was observed in either of the present patients, and the depression of urinary electrolytes very much less : in case 2 the urinary urea increased only to 1·85 g. per 100 ml. the day before death, at which time the urinary Na was 7 m.eq. per litre and the urinary Cl 0. Unfortunately the total osmolar concentration was not determined.

The abnormal tubular reabsorption in these patients was not confined to sodium and chlorine. In another patient (not described here), who had very high serum-sodium and serum-chlorine levels with adequate urinary volume but negligible urinary concentration of these ions, sodium thiosulphate was given intravenously. The glomerular filtration, calculated from endogenous creatinine, was about 160 ml. a minute, but the thiosulphate "clearance" worked out at 2·2 ml. a minute, showing that this foreign ion was also being abnormally reabsorbed.

The distribution of fluid and electrolytes between the various body compartments may be disturbed, and Borst (1938, 1948) considers that the hyperelectrolytæmia observed from time to time after massive gastro-intestinal hæmorrhage is due to a diminution in volume of the circulating blood, and that this is responsible for the excessive renal reabsorption of sodium and chlorine, notwithstanding that there may sometimes be an excess of total extracellular fluid, even to the extent of œdema. Borst (1951) has suggested that the findings in head injury are due to the diminished volume of circulating blood, but this is disputed by Higgins et al. (1954).

In case 1 there was evidence of hæmoconcentration, the hæmoglobin increasing from 100% on admission to 106–108% during hyperelectrolytæmia. The subsequent decrease to about 80% at the end of the hyperosmolar period was probably partly due to hæmodilution, but the effect of the infection in causing anæmia cannot be ruled out.

The effect of mersalyl affords support for the theory that the diminished volume of circulatory blood is a factor : the day mersalyl was given the blood-urea level had fallen to 150 mg. per 100 ml. and the serum-sodium level to 154 m.eq. per litre. After diuresis, with the loss of about 1200 ml. of water, these levels rose again to 227 mg. per 100 ml. and 161 m.eq. per litre. Borst and de Vries (1950), however, observed practically no response to mercurials in the patients with the syndrome due to a small volume of circulating blood.

The blood-electrolyte levels are related to changes in renal function. The glomerular filtration-rate, measured by endogenous creatinine-clearance, rose from 35 ml. a minute on Dec. 19 to 69 ml. a minute on Dec. 22, as the serum-sodium and serum-chlorine levels were falling. After mersalyl the creatinine clearance decreased again to 34 ml. a minute on Dec. 29, and the serum-sodium and blood-urea levels rose. During the next four days, when the serum-electrolyte levels fell to normal values, the creatinine-clearance increased to 79 ml. a minute and the urea-clearance to 58 ml. a minute. Throughout there was an inverse relationship between creatinine-clearance and the levels of sodium, chlorine, and urea in the blood.

During the four days from Dec. 28 to Jan. 2 the serum-sodium level fell from 161 to 131 m.eq. per litre and the serum-chlorine level from 112 to 92 m.eq. per litre. These falls were not associated with any significant urinary excretion of electrolytes and must have been

due to either dilution through expansion of the body-fluids or redistribution of fluids (and electrolytes) within the body. Although the available data are insufficient for a definite decision between these alternatives, the second seems the more probable. Even with as low a figure as 30 litres for total body water this dilution of 18% would mean a retention of 5·5 litres of water during the period. Although urinary collections were incomplete during two days, there was no indication in the output of urine or in the intake of fluids to suggest such a retention.

Although data of the output of salt during the first fortnight of illness are not available, the suggestion of salt deficiency might be regarded as supported by the fact that practically no chlorine and negligible sodium were excreted during a period in which 48 g. of salt (820 m.eq.) was administered, but the findings differ from an ordinary salt deficiency in the intensity of the retention. Further, in cases of severe salt deficiency the excretion of small quantities of sodium and chlorine usually begins almost as soon as salt is administered and long before a gross salt deficiency has been remedied. The serum-sodium (134–139 m.eq. per litre) and the serum-chlorine (90–94 m.eq. per litre) were slightly low, but the return of chlorine and sodium to the urine was not associated with any significant change in these levels: on Jan. 19, by which time the urinary concentration of chlorine had increased to 41 m.eq. per litre, the serum-chlorine was still only 90 m.eq. per litre.

The importance of potassium deficiency in poliomyelitis has been emphasised by Lans et al. (1951) and Hall and Sherman (1953), and it might be suggested that the renal abnormality was due to potassium deficiency. It is true that the excretion of electrolytes started again shortly after potassium chloride had been given, but this was probably merely coincidental: the amount given before chlorine reappeared in the urine was only 6 g. of KCl (80 m.eq. of potassium), and this quantity is quite insufficient to have significant effect on a real potassium deficiency.

Antidiuretic Hormone

The association of hyperelectrolytæmia with diabetes insipidus has been well worked out by Engstrom and Liebman (1953): in one case of anterior and posterior pituitary deficiency following pregnancy the patient always had high levels of sodium and chlorine when not receiving vasopressin. The values fell to normal when vasopressin was given, and the concentration, but not the total amount, of urinary sodium and chlorine increased. In the case published by Peters (1948) of hyperelectrolytæmia following operation on a craniopharyngioma and in the cases published by Cooper and McCarty (1951) there was evidence of a postoperative acute diabetes insipidus.

The possibility of interference with the production of antidiuretic hormone needs consideration in the present cases also. In case 1 the early polyuria might have been due to lack of antidiuretic hormone, this leading to dehydration, and excessive production of aldosterone (cf. Bartter et al. 1956, Muller et al. 1956); the failure to excrete sodium and chlorine would then be due to continued excessive production of aldosterone. It has been pointed out that the return of electrolyte excretion in the urine was preceded by a sharp diminution in the volume of urine (fig. 3). Could this be due to a return of antidiuretic hormone and an associated decrease in aldosterone activity? This cannot be regarded as proved but gives suggestions for further work.

Kriss et al. (1948) and Kaplan and Rapaport (1951) have shown that the excretion of sodium and chlorine is also controlled by the action of the splanchnic nerves on the renal tubules. It is, of course, possible that some alteration in splanchnic activity is concerned in this syndrome, but there is no way of demonstrating this.

Whatever the final decision about the cause of this condition, there are definite lessons for the management of severe cases of poliomyelitis, particularly in the severe bulbar form. The serum-electrolyte levels should be watched. If the serum-sodium and serum-chlorine levels rise, salt should be discontinued and additional fluid given. (The fluid intake in case 1 in the early stages was probably insufficient.) When the serum-electrolyte levels return to normal, salt should be added cautiously, but perhaps more rapidly than in case 1, and the possibility of a potassium deficiency must also be borne in mind.

Astrup et al. (1954) found serum-sodium and serum-chlorine levels usually normal or low in poliomyelitis. Probably this hyperelectrolytæmia is a comparatively rare complication of poliomyelitis, but its existence, with the cessation of urinary excretion, makes the determination of serum-electrolyte levels necessary and emphasises the danger of relying solely on observations of urinary excretion by the Fantus test.

Summary

Two cases of bulbar poliomyelitis showed a nearly complete suppression of urinary excretion of sodium and chlorine. One of them also showed gross hypernatræmia and hyperchloræmia.

Excessive excretion of aldosterone was present in one of the cases. Reasons are given for considering that this chemical syndrome is due to some cause other than simple dehydration.

These chemical changes may have been associated with interference with secretion of antidiuretic hormone; the consequent polyuria and dehydration may have led to the increased production of aldosterone, which in turn may have been responsible for the retention of sodium and chlorine.

My thanks are due to Dr. J. P. Marsden for allowing me to investigate the cases; Dr. H. G. Close and the laboratory staff at Joyce Green Hospital for much assistance; Sister G. Sims for her care in collecting specimens; and Mr. P. J. Hawker and Mr. J. W. Moreton for most of the analyses.

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AMIPHENAZOLE IN A CASE OF DRUG ADDICTION

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THE dangers of narcosis and respiratory depression have often prevented the full use of the pain-killing qualities of the opium alkaloids; and the risk of addiction is another bar to their continued administration. Amiphenazole (2 : 4-diamino-5-phenylthiazole hydrochloride) has recently been found to stimulate the respiratory centre. The concurrent administration of amiphenazole and morphine abolishes the depressant action of morphine on respiration (Shaw and Bentley 1955). Larger doses of morphine (200 mg.) can safely be administered, so that the maximum analgesic action is obtained but respiratory depression is slight. Moreover, the vomiting and constipation sometimes caused by morphine are often abolished when it is given with amiphenazole.

The successful treatment of pethidine and 'Omnopon' addiction by amiphenazole has not yet been reported in this country.

Case-report

A married woman of 26 fell ill with pulmonary tuberculosis in 1943. After hospital treatment she recovered and remained well until November, 1953, when she had an attack of pneumonia. She was admitted to hospital in April, 1954, with very extensive bilateral pulmonary tuberculosis with large thick-walled cavities. Under treatment with anti-tuberculosis drugs there was some improvement. Drug resistance developed and improvement was not maintained.

In June, 1956, she began to have repeated daily hæmoptyses and severe chest pain. Her condition then steadily deteriorated and the prognosis became hopeless. Pethidine gave some relief, but the symptoms were effectively controlled only by morphine. Later, owing to gastro-intestinal upsets, omnopon was given instead. During the next four months she was given on an average 200 mg. of omnopon and 300 mg. of pethidine daily.

The patient was depressed and confused, anorexia was extreme, and she became even more emaciated. Peripheral œdema developed. She was persistently cyanosed, even with almost continuous oxygen therapy. During this time the patient became an obvious addict and demanded injections as soon as the effect of the previous one was wearing off, pleading pain, although we were seldom convinced of its presence.

On Nov. 17 we began treatment with morphine and amiphenazole. During the next three days she was given a total of 2·842 g. of morphine subcutaneously and 1·06 g. of amiphenazole orally. There was an immediate change in her condition. She became mentally bright and alert, cyanosis disappeared, her appetite improved, and the œdema subsided. Apathetic for months, she now became anxious to try a new antituberculosis drug and moved around freely in bed.

For the next ten days no morphine was given. The patient had no desire for further injections and required no sedation apart from a short-acting barbiturate at night. Since then a small dose of morphine (16 mg.) covered by amiphenazole (20 mg.) has been required occasionally for obvious severe pain. She now dislikes these injections, which is in marked contrast to her previous attitude.

Comments

This patient had obviously become addicted to omnopon and pethidine. This addiction was rapidly cured by amiphenazole without any withdrawal symptoms.

It may be that amiphenazole should be given concurrently during prolonged medication with an opium alkaloid or the synthetic analgesics, pethidine and methadone hydrochloride. Further investigation into the value of amiphenazole in the prevention and cure of addiction might be profitable.

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Preliminary Communication

ERYTHROCYTE-POTASSIUM LEVEL IN RHEUMATOID ARTHRITIS

THE administration of adrenocortical steroids in man results in a net loss of potassium from the body and lowers the level of intracellular potassium. Streeten and Solomon [1] have shown that the administration of corticotrophin or cortisone does not lower the potassium content of the erythrocytes but probably raises it. Their investigations suggest that, as regards their content of potassium, the behaviour of erythrocytes towards adrenal steroids differs from that of other body cells.

Sherwood Jones [2] investigated the distribution of electrolytes between erythrocytes and plasma in 3 patients with Addison's disease and in 2 patients with Cushing's syndrome. They reported, however, normal levels of sodium and potassium in the erythrocytes.

In view of a possible association between the adrenal steroids and the erythrocyte-K^+ level and the association of the collagen group of diseases with adrenal steroid metabolism, we decided to investigate the erythrocyte-K^+ levels of patients with collagen diseases.

We report here the initial results obtained in patients with rheumatoid arthritis.

METHOD

A simple standardised procedure was adopted suitable for routine laboratory analyses. Estimations of the erythrocyte-K^+ level were based upon an indirect method requiring the determination of the whole-blood-K^+ level, the plasma-K^+ level, and the hæmatocrit reading. Heparinised venous blood was used for the determinations. The estimations were undertaken with as little delay as possible; and provided they were carried out within four hours of venepuncture, there was no significant loss of cell-K^+.

The whole-blood K^+ was estimated in duplicate, the samples being prepared by diluting whole blood 1 in 1000 with distilled water. The maximal acceptable deviation between duplicates was 0·5 m.eq. per litre for whole blood. Flame-photometer standards containing the appropriate sodium "background" gave complete linearity of scale over the working range of K^+ values.

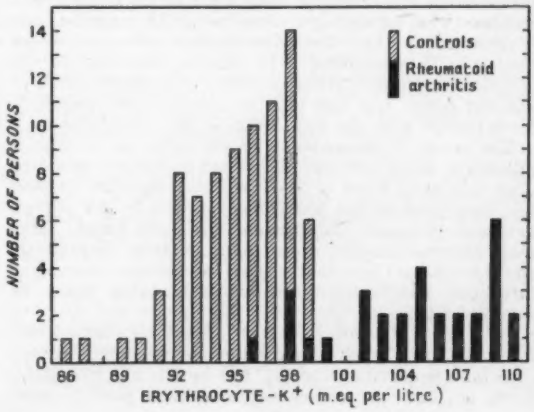
Plasma K^+ was estimated on 1 in 100 dilutions of plasma. Hæmatocrits were determined in Wintrobe tubes by centrifuging for thirty minutes at 3000 r.p.m. in a governor-controlled centrifuge.

SUBJECTS INVESTIGATED

The erythrocyte-K^+ level was investigated in the following groups:

(1) "Controls" composed of medical students of either sex and patients with diseases other than of the collagen group or conditions known to be associated with electrolyte disturbance.

1. Streeten, D. H. P., Solomon, A. K. *J. gen. Physiol.* 1954, **37**, 643.
2. Jones, E. S. *Nature, Lond.* 1955, **176**, 269.



(2) Patients of either sex with "active" or "quiescent" rheumatoid arthritis. None were on steroid therapy.

RESULTS

The distribution of erythrocyte-K^+ levels in the 80 "controls" is shown in the accompanying figure. None of the "controls" had an erythrocyte-K^+ level higher than 99 m.eq. per litre. The distribution of

12 CASES OF RHEUMATOID ARTHRITIS IN MALES

Case no.	Age (yr.)	Erythrocyte-K^+ level (m.eq. per litre)
1	30	98
2	55	101
3	44	104
4	53	106
5	46	107
6	..	104
7	..	105
8	66	98·5
9	50	100
10	65	102
11	60	98·5
12	66	106

erythrocyte-K^+ levels in 31 women with rheumatoid arthritis is also shown in the figure. In this group 5 patients had erythrocyte-K^+ levels below 100 m.eq. per litre and 26 had 100 m.eq. per litre, or more. Of 12 men with rheumatoid arthritis (see table) 3 had erythrocyte-K^+ levels within the range of figures obtained for the "controls."

No correlation was found between hæmatocrit reading, cell size, hæmoglobin content, age of patient, and erythrocyte-K^+ level.

Clinical assessment of the patients suggested that the erythrocyte-K^+ level may be related to the degree of activity of the disease.

CONCLUSIONS

The results obtained in this preliminary series indicate that patients with rheumatoid arthritis tend to have erythrocyte-K^+ levels higher than the accepted normal range. The finding may be more constant in females than in males.

The cause of the raised erythrocyte-K^+ level is unknown. Among other hypotheses, possible alterations in steroid metabolism, and their effects on the permeability of the erythrocyte, are being considered.

A larger series of patients and a series of matched controls are under investigation in conjunction with the department of physical medicine of the Middlesex Hospital. It is intended to study the relation of erythrocyte-K^+ levels to activity of disease and to steroid metabolism, and to assess the value of the investigation in the diagnosis of rheumatoid arthritis and the ability of the test to differentiate this disease from similar conditions.

Our thanks are due to Dr. A. C. Boyle and Dr. D. Mattingly for referring patients to us and for their clinical assessment of the cases, and to Sir Charles Dodds for his interest in the work.

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Medical Societies

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE

Toxoplasmosis

THE society met in London on Jan. 17, with Prof. R. M. GORDON, the president, in the chair, to discuss Toxoplasmosis.

Prof. P. C. C. GARNHAM said that the prevalence of toxoplasma infection in man has been put as high as 50% in some communities, on the basis of serological tests, of which the dye test is the commonest. The validity of this test has been doubted, and possibly man may acquire antibodies to sarcocystis passively from cattle, sheep, and pigs, which are commonly infected with that organism; such antibodies may give a positive reaction in the dye test for toxoplasma.

Prof. C. P. BEATTIE said that severe and fatal forms of toxoplasmosis first attracted notice, but these are rare. Mortality in severe congenital forms is high, and children who survive are often mentally retarded, but it seems likely that even in congenital infections severe disease is the exception. In the acquired disease the commonest manifestation is lymphadenopathy, with or without fever, and this may be mistaken for glandular fever except that the Paul-Bunnell test is negative.

The mode of transmission of the infection to man is unknown. Many species of birds and mammals (including dogs and cats) have it, and tests indicate that persons handling animals are particularly prone to get it; no evidence of insect transmission has been found. Man may become infected from man, or from imperfectly cooked meat. No doubt there are many sources of infection, and transmission probably takes place by several routes.

Dr. I. A. B. CATHIE said that it has been claimed that infection with *Trypanosoma cruzi* and trichomonas may give false positive dye tests; but he has not found this to be so, and has not encountered false positive complement-fixation tests in malaria or *Salmonella typhi* infections. Inactivation at 56°C for 30 minutes does not reduce the titre of the dye-test antibody in human serum, and these antibodies, therefore, cannot be identified with properdin; but the sheep antibody is inactivated at 56°C, and therefore differs from the human antibody.

Dr. R. LAINSON cited published work on the prevalence of this infection in animals, assessed by serological tests or isolation of the organism. Isolation is the only sure proof of infection, and, since toxoplasma has not yet been cultivated on media free from living cells, isolation requires passage to "clean" laboratory animals. Intraperitoneal inoculation of mice with brain tissue is convenient and satisfactory. The morphology of strains isolated (there is only one species of toxoplasma) is uniform, and the strains are serologically and immunologically similar, though they may vary greatly in virulence. Dr. Lainson reported isolations from weasels, ferrets, polecat-ferret hybrids, and rats in England. The carnivores may become infected by eating infected flesh, possibly that of rabbits. It appears that toxoplasma is a benign and well-adapted parasite.

Prof. R. J. V. PULVERTAFT showed a film of toxoplasma invading living cells or being phagocytosed by them.

Dr. J. K. A. BEVERLEY remarked that a dye test of titre 1 in 500 or a complement-fixation test of 1 in 16 may be taken as indicating active infection. A rising titre is important, but the rise is not rapid. A weak complement-fixation test may indicate old infection, and active infection can occur with a weak dye test, though subclinical infection can provoke high titres. There is some evidence that pyrimethamine, the sulphonamides, and the sulphones are useful in treatment of the disease in animals.

Dr. J. D. FULTON described his method of isolating the organism for metabolic studies; glucose is the chief material used by it.

Colonel J. H. WALTERS cited evidence which suggests that toxoplasmosis may be widely endemic in West Africa, and said that it gives rise to a syndrome which may be mistaken for glandular fever.

Dr. BEVERLEY reported a laboratory infection from a contaminated hypodermic needle. Dr. CATHIE reported the case of a laboratory worker who had worked with toxoplasma for several years without the dye test becoming positive; and then suddenly the test became positive without the patient having had any illness or any other event which could explain it.

THE RENAL ASSOCIATION

Azotæmic Renal Osteodystrophy

AT a meeting of this association on Jan. 24, Dr. S. W. STANBURY insisted that the clinical and biochemical investigation of the problems of azotæmic renal osteodystrophy should be based on a firm knowledge of the pathological state of the skeleton. Neglect of histological study, which could often be made on biopsy specimens, had led to several serious misconceptions. It was, for instance, universally assumed that osteitis fibrosa was the only osseous complication of uræmia in the adult. By reference to the clinical and histological findings, in particular adult patients with chronic uræmia, he was able to demonstrate both the development of florid osteomalacia and its presumptive cure by large doses of the vitamin-D steroids. Histological preparations of rachitic metaphyses were shown to support the claim that the uræmic child could develop true rickets. This was certainly "rickets" when considered from the osteologist's viewpoint as "a failure of mineral deposition to keep pace with the endochondral growth of bone." Turning to the possible ætiology of the defective mineralisation, Dr. Stanbury pointed out that the azotæmic patient wasted neither calcium nor phosphorus in the urine, but the intestinal absorption of both was defective. As was the case with vitamin-D-resistant rickets (osteomalacia), this defect could be overcome by large doses of either calciferol or dihydrotachysterol, although the dangers of overdosage were considerable. During successful treatment, calcium and phosphorus were retained in a ratio of approximately 2 to 1, and the osseous lesions were seen to heal radiologically. Healing was accompanied by an increase in the level of blood-citrate. Reasons were given for believing that the metabolic defect represented an acquired insensitivity to vitamin D, for which it was unlikely that either systemic acidosis or elevation of the serum-phosphate could be held responsible. A similar defect could occur in patients with lowered rates of glomerular filtration but without azotæmia, and also in nephrotic children. No cause could be offered for the vitamin-D resistance but it did not appear to be due to a simple failure to absorb the vitamin.

The other osseous lesion occurring commonly in azotæmia was osteitis fibrosa; it could occur together with osteomalacia or independently. The osseous changes were indistinguishable from those of primary hyperparathyroidism and, as in that condition, the presence of osteitis fibrosa was always accompanied by a reactive or reparative formation of new bone. Clinically, renal osteitis fibrosa was best and earliest seen in the finger radiograph as erosions or "scalloping" of the cortical surfaces of the phalanges. It was probable, to the point of certainty, that a functional hyperparathyroidism was responsible for these lesions; but there was little direct evidence to indicate the cause of this secondary change. From his personal experience of the condition, Dr. Stanbury had two observations to make. First, that the patient need not have rickets or osteomalacia prior to the development of hyperparathyroidism. Secondly, one could not safely assume that the production of a positive calcium balance or even of hypercalcæmia would lead to regression of the parathyroid hyperplasia. This may conceivably happen in some patients after vitamin-D therapy; but in others hyperparathyroidism would continue and the lytic processes of osteotis fibrosa would release mineral from the recalcified skeleton. This in turn could lead to extreme degrees of metastatic calcification.

Prof. C. E. DENT said that little had been added to our knowledge of this condition since Liu and Chu had described the major defect as being an inability to absorb calcium from the gut, with a negative calcium balance due to fæcal rather than urinary losses. This resembled vitamin-D deficiency, but they had found that this vitamin did not correct the rickets or reverse the calcium balance, though A.T.10 did. (The dose of A.T.10, however, had been relatively much greater.) Professor Dent had fully confirmed these findings but had found that calciferol could produce as good a response as A.T.10 if given in corresponding amounts. In one case he described in detail, the plasma-phosphorus rose but the calcium fell in spite of a strong positive balance; the urinary phosphate excretion rose with the plasma level, but the balance of phosphorus also became positive. In azotæmia, pure rickets could occur with no evidence of osteitis fibrosa at necropsy, even when the essential renal lesion was glomerular. The type of bone disease was therefore independent of the renal lesion. It was usual to ascribe it to acidosis but giving alkalis with vitamin D produced no effect beyond that of the vitamin alone. Renal hyperparathyroidism always responded equally well to this treatment, and this may be seen in as little as three weeks. In one case, osteitis fibrosa healed but the renal rickets got worse; this was apparently due to a phosphate deficiency brought about by treatment with aluminium hydroxide, for it rapidly healed when this was stopped. Another type of bone lesion seen was osteosclerosis.

All three types of bone lesion seen in renal failure could also be seen in steatorrhœa, and resistance to vitamin D could then be demonstrated even when it was given parenterally. It was possible that some anti-vitamin-D factor was circulating in renal failure, as was originally suggested by Liu and Chu. Such a substance might, like cortisone, partly reverse the action of vitamin D. With adequate vitamin-D therapy renal osteodystrophy always improved spectacularly even at a time when renal failure was progressing.

Reviews of Books

Hearing Defects in School Children

Scottish Council for Research in Education (publication no. 38). London: University of London Press. 1956. Pp. 110. 10*s*. 6*d*.

THIS excellent monograph records very carefully the results of an investigation into hearing defects in children, mainly at ordinary schools.

The authors stress the great importance of standardising the techniques of audiometry. Most of the screening tests in ordinary schools have, unfortunately, to be carried out in a considerable level of background noise, but noises of up to 45 decibels can be present without affecting the threshold of hearing at any of the "speech" frequencies. This noise level should be regarded as the maximum permissible in testing, even if the earphones are well designed.

In attempting to correlate the degree of hearing loss with educational attainment, the committee found that a group of 12-year-old children with average hearing losses of over 20 decibels were retarded by 8 or 9 months in comparison with a corresponding control group of normally hearing pupils. They concluded that even slight or moderate defects of hearing could constitute a serious educational handicap and that quite severe deafness had commonly escaped the notice of teachers. Since many of these children could be cured or relieved by treatment, and since the educational handicap could be minimised by appropriate attention (even when medical treatment failed), audiometric testing of every

child should be regarded as essential. The wisdom of these conclusions will be evident to anyone who reads the text in full.

Roentgen Signs in Clinical Diagnosis

ISADORE MESCHAN, M.A., M.D., professor and director of department of radiology at the Bowman Gray School of Medicine of Wake Forest College, Winston-Salem, North Carolina, U.S.A. Philadelphia and London: W. B. Saunders. 1956. Pp. 1058. £7.

IN this book of little more than a thousand pages, the author has provided a comprehensive survey of nearly every aspect of diagnostic radiology, and has in addition included chapters on radiographic techniques and radiation protection. He has achieved this remarkable concentration of material by great economy of words in the text and by copious use of line drawings and diagrams in place of radiographs.

In arrangement the work follows the pattern which is becoming increasingly popular in radiological textbooks—namely, of describing radiographic appearances, and then discussing the probable causes. This method works well when the objective radiographic signs are clear and the possible causes few; but otherwise it may lead to confusion and repetition. This danger, of which the author is obviously aware, is especially evident in the chapters on diseases of bone.

This textbook will almost certainly become a standard work.

Doctors in the Air

Wing-Commander ROBERT MAYCOCK, A.F.C. London: Allen & Unwin. 1957. Pp. 145. 15*s*.

DOCTORS entering the Royal Air Force learn something of the stresses to which people who fly may be subjected, and during a short introductory course in aviation medicine at Farnborough see some of the many facets of the subject. Probably few others appreciate the number of factors which must be reckoned with to ensure safety and even survival in the air.

Wing-Commander Maycock opens with a brief historical sketch of aviation, and logically progresses to problems of oxygen lack at altitude, *g* stress, and escape from high-speed aircraft. Chapters of autobiography indicate the wide range of the author's Service activities, and lead to discussion of further problems such as fatigue in aircrew and transport of casualties. It is apparent how widely "applied physiology" enters into the design of a great deal of flying equipment, but technicalities are kept to a minimum.

Though partly a personal narrative, the book clearly describes some of the important problems which had to be solved before man could safely fly fast and high; and it will bring to many readers some idea of the wide field covered by aviation medicine.

La kinésithérapie dans le traitement des algies vertébrales

L. CHARRIÈRE, professeur d'éducation physique, kinésithérapeute des Hôpitaux de Lyon. Paris: Masson. 1956. Pp. 156. Fr. 1200.

WITH the increasingly conservative attitude towards backache of all descriptions, the physiotherapy departments are taking an ever greater part in its treatment. This unpretentious little book gives clear instructions on how exercises and postural therapy can be applied to these conditions. The many diagrams are simple and to the point, although that of spondylolisthesis is incorrect and on the purely medical aspects the author is frequently open to criticism. In his own field he is excellent, and physiotherapists will find this book worthy of study.

The Human Machine

An Analysis and Description of the Human Body, and its Structure and Functions, in Terms of Inanimate Machinery. Sir ADOLPHE ABRAHAMS. Harmondsworth: Penguin Books. 1956. Pp. 200. 3*s*. 6*d*.

IT is the human machine in athletic activity which the author has really at heart, and the motor-car is the machine with which he compares and contrasts it. The book will thus appeal chiefly to athletes and the athletically minded, who should find it instructive, illuminating, and salutary, with its ingenious analogies, its athletic erudition, and the cold douches of fact and common sense sprayed upon hoary myths and superstitions. It seems odd to postulate "Nature" as the purposeful designer of the human frame and at the same time write off our hopes and fears as activities of our central nervous systems, but perhaps philosophy should be left to philosophers.

Blood Transfusion in Clinical Medicine (2nd ed. Oxford: Blackwell Scientific Publications. 1956. Pp. 587. 45*s*.).—The appearance of a second edition of this book by Dr. P. L. Mollison will be welcomed by those in any way concerned with blood-transfusion. This edition will enhance the reputation quickly and deservedly won by the book when first published in 1951. The developments since then—in many of which Dr. Mollison has himself had a hand—have necessitated extensive revision and the introduction of much new material. One feature which distinguished the first edition has fortunately not been lost—the greater part of the book is based on the author's personal experience. This work can be highly recommended.

Diseases of the Heart (2nd ed. Philadelphia and London: W. B. Saunders. 1956. Pp. 1161. 6 guineas).—The second edition of this well-known textbook by Dr. Charles K. Friedberg maintains the high standard set by the first. Three new chapters on graphic methods of cardiovascular examination have been added, and the section on cardiac surgery has been extensively revised to include the latest advances in surgery under direct vision, such as pump oxygenators, and hypothermia. The book is up to date, and the exhaustive bibliography at the end of each chapter adds greatly to its value. The author scrupulously gives a balanced picture on many controversial matters, commonly adding his own summing up. This work is of great value to students and senior practitioners alike.

Modern Operative Surgery (4th ed. London: Cassell. 1955; vol. 1, pp. 1229. 70*s*. 1956; vol. 2, pp. 2614. 75*s*.).—Many British surgeons were brought up on this work by the late Prof. G. Grey Turner. Being accustomed to it they will be glad to greet the new edition, edited by Prof. Lambert Rogers, as an old friend whose face has changed little. The prefix "modern" should not, however, be allowed to mislead young surgeons. Doubtless in an endeavour to present operative surgery over an era, procedures now outmoded are still described; though greater emphasis on current practice might be an advantage. Perhaps future editions, of which there are likely to be many, will provide better illustrations and a fuller and more representative bibliography.

Cardiopathies congénitales (2nd ed. Paris: Expansion Scientifique Française. 1956. Pp. 448).—The first edition of this comprehensive work by Prof. P. Soulié appeared in 1951. The author and his collaborators have now revised the text and added new chapters on scalar and vector cardiography, aortico-pulmonary fistula, aortic stenosis, and arteriovenous aneurysms of the lung. The book is in three parts. The opening chapter of the first part deals with embryobiological anatomy, the second and third chapters with cardiac catheterisation and angiocardiography respectively. There is a complete chapter devoted to cardiac shunts, cyanosis, and classification of the congenital cardiac anomalies. The chapters in the second half of the book deal individually with the different forms of congenital heart-disease. The third part of the book is devoted to anæsthesia and surgical techniques, including cross-circulation methods, pump oxygenators, and hypothermia. This excellent and well-illustrated textbook should be of great value to all students of congenital heart-disease.

Nature of Viruses (London: J. & A. Churchill. 1956. Pp. 292. 42*s*.).—The proceedings of the symposium on the biophysics and biochemistry of viruses held in London in March, 1955, under the chairmanship of Sir Charles Harington, F.R.S., have now been published. The editors for the Ciba Foundation, which organised the symposium, are Dr. G. E. W. Wolstenholme and Miss Elaine Miller.

Hypotensive Drugs (London and New York: Pergamon Press. 1956. Pp. 222. 50*s*.).—A conference on these drugs and the control of vascular tone in hypertension was held at the Wellcome Foundation, London, last April. The proceedings have now been published under the editorship of Dr. Michael Harington.

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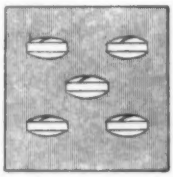

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THE LANCET
LONDON: SATURDAY, FEB. 2, 1957

Prognosis of Congestive Failure in the Elderly

CONGESTIVE heart-failure is one of the commonest reasons for the admission to hospital of people over the age of 65. In the absence of co-existing disease unrelated to heart-failure, considerable and often dramatic improvement usually follows the application of the accepted principles of treatment for congestive failure at all ages, especially when it is coupled with an attack on any known underlying cause, such as anæmia, thyrotoxicosis, or exacerbation of chronic respiratory infection. It has long been apparent that if old patients could all receive the best standard of hospital care then the prognosis of congestive heart-failure would not be so poor as it is generally held to be.

BEDFORD and CAIRD [1] point out that little has been written about the prognosis of congestive failure in the elderly, and they have made a detailed study of the condition in 231 patients of 65 or over, who represent 14% of all admissions to the geriatric unit at Cowley Road Hospital, Oxford, during the forty-six months from July 1, 1949, to April 30, 1953. The patients were divided into nine ætiological groups: normotensive, hypertensive, aortic, rheumatic, pulmonary, syphilitic, thyrotoxic, anæmic, and miscellaneous. In considering patients of this age, myocardial ischæmia was presumed to be a constant ætiological factor. "Normotensive" meant normal blood-pressure and no evidence of any of the conditions in the other groups. Thus, the underlying cause of failure was myocardial ischæmia alone, for it was impossible to assess the contribution of precipitating factors in any group because many patients were too ill to give a reliable history. 229 patients were successfully followed for one and two years, 162 patients for three years, and 92 for four years; and the corresponding survival-rates were 36%, 27%, 20%, and 16%. These figures are impressive; but, as BEDFORD and CAIRD remark, the outcome of a single episode of congestive failure is probably even better than these findings indicate, since any hospital series is heavily loaded against survival because it contains many examples of recurrent or resistant failure and a high proportion of patients with some other lethal disease which determines the prognosis. Some of the prognostic conclusions which BEDFORD and CAIRD have derived from their analysis seem, at first sight, to conflict with orthodox teaching. Thus, if an elderly patient survives an episode of congestive failure, and the few months that follow it, his expectation of life is not materially shortened. Though 64% of the deaths took place in the first twelve months after the initial failure, the expectation of life of those patients who survived for a year was at least equal to the normal; and, moreover, the age of the patient was not of prognostic significance. In view of these findings, it is obviously important to tackle with vigour the first bout of congestive failure in an old person and not simply to regard it from the onset as "terminal cardiac failure." Again, as a generalisation, the prognosis in failure does not depend on the cause of the heart-disease. For example, the poor prognosis formerly accorded congestive heart-failure due to calcareous aortic stenosis is shown to be false when this condition is assessed by modern diagnostic criteria; and BEDFORD and CAIRD's findings support those previously recorded by KUMPE and BEAN [2] and LEWES.[3]

It is not surprising that the survival-rate was better in the normotensive group than in the hypertensives at all ages in the Oxford survey. What is surprising is the greater number of deaths among hypertensive women, despite the better prognosis of hypertension in women than in men at all ages. This difference may be due to the excess of women who die from hypertensive heart-failure in the 70s, as demonstrated by CLAWSON,[4] or possibly to a greater incidence of auricular fibrillation in women. In normotensive patients, the cardiac rhythm did not affect the prognosis; but only 9% of hypertensive subjects with auricular fibrillation survived two years, compared with 33% of hypertensives with normal rhythm. BEDFORD and CAIRD's figure of 6% of patients with congestive failure due to rheumatic disease of the mitral valve indicates the care they took in establishing the diagnosis. Rheumatic heart-disease is not rare in the elderly, but it may be hard to recognise. When, at the turn of the century, rheumatic fever and its severe complications were more common than they are today, the seriously affected patients were easily recognised, and most of them died before the age of 40. Those with less badly damaged hearts have survived to old age, most of them with mitral incompetence rather than stenosis, and nearly half with normal rhythm. When symptoms begin late in life, often with few physical signs, the underlying condition may readily be overlooked. The prognosis in the rheumatic group, however, is much the same as that of normotensive congestive failure.

An analysis of the causes of death is essential to a better estimate of prognosis. In BEDFORD and CAIRD's series 146 patients died in hospital, and 101 were examined post mortem. In 33% death was attributed to bronchopneumonia arising either during the episode of congestive failure (8%) or after the heart-failure had resolved and the patient was under treatment for some dissociated condition (25%). Death due to resistant or recurrent attacks of failure accounted for 16% and pulmonary embolism for 14%. The figure for embolism may be too low since some of the very sudden deaths were not followed by necropsy and may have included a number of massive pulmonary embolisms. Surprisingly, cardiac infarction accounted for only 5%, but it was included as a cause of death only when the infarction occurred in the last few days of life and when it was confirmed by electrocardiography, necropsy, or both. Co-existing lethal disease accounted for 7%, and remote causes, such as uræmia and cerebrovascular accidents, for 14%. The high proportion of deaths due to bronchopneumonia is partly a reflection of failure to prevent, detect, or treat this condition in elderly patients

1. Bedford, P. D., Caird, F. I. *Quart. J. Med.* 1956, **25**, 407.
2. Kumpe, C. W., Bean, W. B. *Medicine, Baltimore*, 1948, **27**, 139.
3. Lewes, D. *Brit. med. J.* 1951, i, 211.
4. Clawson, B. J. *In* Hypertension. Minnesota, 1951.

with congestive failure; and the high death-rate from pulmonary embolism is a challenge yet to be met. BEDFORD and CAIRD believe that there is a prima-facie case for giving anticoagulants to all elderly patients in congestive failure, though they admit that many things may complicate the situation and make the treatment unsuccessful. It is plain that further experience and knowledge are needed, particularly in the important matter of treatment in the home.

Practitioner and Local Authority

"LET's face it, Clinics Are Unethical" said RICHARD COBBLEIGH at the end of the brisk exchanges which followed his contribution to the Widdicombe File.[1] The correspondence which we published under the title Clinicosis illustrated several different views of the work done in local-authority clinics, but few of those who wrote to us would deny that young COBBLEIGH's remark points to one of the big obstacles to reconciliation between therapeutic and preventive medicine as now practised by general practitioner and local-authority doctor. Nor can anyone be entirely satisfied with a system which evokes so many expressions of dissatisfaction: the clinic doctor is often aggrieved by the restrictions placed on the treatment he can give at the clinic; the general practitioner argues that the work would more properly and effectively be done by him; and, unhappily, each side sometimes accuses the other of not pulling its weight. To all this a satisfactory solution is unlikely to emerge without adoption of some integrating policy. Indeed, the uneasy relations between general practitioner and local authority have created such a situation as we had in mind when we referred lately to the need for a return to planning.[2]

We welcome therefore a useful step in this direction by the medical officer of health for Staffordshire, Dr. GERALD RAMAGE, who has prepared a reasoned analysis[3] of the problem of the general practitioner and the local authority's personal health services. He has compared, in an objective way, the views of general practitioners and local-authority doctors on the work they do; and, in the light of these opinions, he discusses the difficulties to be overcome. In assessing the value to the community of the local authority's services, RAMAGE refers especially to the defects and illnesses of childhood: the clinic workers undoubtedly discover many abnormalities in the children they see, among them conditions that are much the better for early treatment. It has often been suggested (by GEORGE et al.,[4] for example) that, in child-welfare clinics, the advisory work of the clinic doctors could be taken over by health visitors, and their medical duties by general practitioners. But many mothers who take their children to these clinics do so because they know that there they can see and talk to a doctor who is not too busy to give time to comparatively minor troubles; and attendances might fall away if the child-welfare clinics were staffed only by health visitors. On the other hand, an increasing number of general practitioners are now running "well-children" sessions for their own patients; and, as more and more of them are able to do so, the child-welfare clinics will become empty and the health visitors will be free to give more direct help to general practitioners. And the same could happen in antenatal and other clinics. But it is unlikely to happen for a long time, unless general practitioners are given some financial reward for providing these extra services. As things now are, and as RAMAGE's inquiry illustrates, it is doubtful whether the present size of general practitioners' lists allows them time for anything but a gesture at preventive work. The figures given in the Cohen report on general practice for the length of the practitioner's working week were higher than those derived from a more recent investigation[5]: but what is perhaps more important than hours of work is the practitioner's ability to order his day's affairs around fixed sessions which he can attend with certainty. Group practice is the environment that will do most to help him in this way; and it is in group practice that doctors may have the ampler accommodation needed for effective "clinic" work.

If the general practitioner becomes able and willing to take on much of the work of the clinics, what changes should be made in consequence in the executive direction of the local-authority services? In the second part of his paper RAMAGE explores the possibilities of control other than by the local health authority; and his comparison between the administrative structure and functions of the executive council and the public-health department is very much in favour of the council. For many reasons most general practitioners think poorly of local-authority organisations and would be unwilling to serve under them; they dislike an authority which has power to determine the doctor's relationship with his patients, and which gives the doctors it employs so little say in its organisation. The proposal to merge the present local-authority services with one of the other existing branches of the National Health Service has been resisted on the grounds that such a union could not cater for school medical services and other special departments of the local-authority welfare service. Alternatively, local-authority work might be done by general practitioners if executive-council duties were transferred to the local authority's control; and this, it is said, would make it easier for practitioners to take over the duties of the local-authority doctors, though the plan would be unworkable unless the practitioners were thoroughly satisfied with the arrangements. RAMAGE puts forward a programme whereby practitioners could take over by stages the work now being done by clinic doctors and whereby increasing help could be provided for practitioners who run their own clinics. Under such a scheme many of the "public-health doctors" would ultimately disappear, though there would, of course, always be whole-time posts for other important health-department duties. The responsibility of the local authority for the provision of premises could be extended to include a contribution for suitably designed practice premises, and the doctor practising preventive as well as therapeutic medicine should have access to

1. *Lancet*, 1956, ii, 781.
2. *Ibid*, Jan. 5, 1957, p. 31.
3. Ramage, G. *Med. Offr*, 1957, **97**, 31.
4. George, J. T. A., Lowe, C. R., McKeown, T. *Lancet*, 1953, i, 88.
5. Crombie, D. L., Cross, K. W. *Brit. J. prev. Soc. Med.* 1956, **10**, 141; see annotation, *Lancet*, 1956, ii, 1342.

premises provided for him without paying rent, as does the specialist who works in a hospital.

Few will dispute RAMAGE's final conclusion—namely, that the general practitioner *could* become responsible for the antenatal, maternity, infant-welfare, and school branches of the preventive services. And, if one can judge by the correspondence in our columns, most doctors think he *should* do so. From this point, it could be argued, the course is fairly clear: more general practitioners must be given the opportunity to prevent as well as treat disease and to take over the work of the clinics; and administrative difficulties must be resolutely overcome. But there may be complications. Under the present arrangements, patients can choose whether to seek the advice of their family doctor or that of the clinic doctor for a particular condition; and if the family doctor becomes the patient's only source of immediate help, there may be dangers in such a monopoly of medical advice. Whatever the medical profession may think, there is no doubt that many people in this country value the alternative source of advice provided by local-authority clinics; and it would be wrong to disregard this public opinion. If the clinics go, the picture of the popular all-embracing family practitioner may be disturbed by an outcry in defence of the clinics, as something the public likes rather than something it still urgently needs. Moreover, there may be another administrative formula that would be more acceptable: it might be better to separate the personal health services of the local authority from its other duties to the community, and transfer them to suitably modified executive councils of the National Health Service. This is, of course, just one of several possibilities (another is the plan, proposed by Professor FRASER BROCKINGTON,[6] for making the medical officer of health the coördinator of the medical team, with general practitioners the first and most important agents in public health). Nevertheless, here might be the beginning of an opportunity to link organised preventive medicine with general medical practice at the level where the link would be strongest. Doctors, health visitors, and others now employed by local authorities could be "seconded" to group practices and practice groups, there to work with general practitioners, to teach them and to learn from them. In this way "public health" might quickly come to have a real meaning in general practice.

Treatment of Coarctation of the Aorta

COARCTATION of the aorta should seldom be overlooked if the femoral pulse is sought whenever increased pulsation in the neck, brachial hypertension, or unexplained aortic incompetence are detected. What is to be done when the diagnosis is made? CAMPBELL and BAYLIS[7] have studied 130 patients with coarctation, and they have tried to answer this question by assessing the prognosis. In this series 6 patients died who had seemed quite well a year or two before, and 4 of them were between twenty and thirty years old. Altogether 16 patients died, from causes including congestive failure, rupture of the aorta, bacterial endocarditis, and intracranial hæmorrhage, all well recognised in this condition[8,9]; and some patients died after operation. Symptoms were uncommon in the earlier decades of life, though 4 patients had cerebrovascular accidents before the age of twenty; and the blood-pressure, after rising sharply until the age of seventeen, subsequently remained almost steady. Even in the fourth decade the average diastolic pressure did not exceed 110 mm. Hg, and it is often lower than is generally supposed. There was aortic incompetence in nearly a quarter of the cases, and stenosis in a further 6. CAMPBELL and BAYLIS regard incompetence as the consequence of bicuspid valves rather than rheumatism, and its effects are often slight, with little depression of the diastolic pressure, though the incompetence may become more apparent as age advances. Absence of symptoms is no guarantee against sudden death, and the age of the patients when first seen (only 6 were over thirty-five) suggests a high mortality from the age of twenty onwards. For these reasons, CAMPBELL and BAYLIS now recommend resection in most children, and they feel it should not be long delayed after eight years. Aortic incompetence is an added indication. CRAFOORD[10] and GROSS[11] put the best age for operation at between ten and twenty years, because the aorta is then of adequate size and is still free from degenerative changes. The mortality of resection was 9% in CAMPBELL and BAYLIS's series, and in 648 reported cases they found it to be rather less—7%. In CLELAND et al.'s series[12] of 40 patients who were operated on, 3 died, including 1 who had a dissecting aneurysm and for whom operation was advised as a desperate resort. CLELAND et al. suggested that "a mortality-rate of less than 10% may now be anticipated in practised hands," and the figure is now probably even lower—CAMPBELL and BAYLIS suggest 5% in uncomplicated cases, and after GROSS's last 100 operations there were only 2 deaths.

After a successful resection, the pressure falls in the arms and rises in the legs, but, despite claims to the contrary, COUNIHAN[13] has found that it does not become normal. In 20 patients he found that the postoperative pressures remained higher than would have been expected in normal persons of the same age. The obvious explanation—that the stricture was incompletely relieved—was rejected by COUNIHAN for a number of reasons. The collateral circulation disappeared after operation, and the femoral pulse-wave, measured by sphygmograms, became synchronous with, or just preceded, that in the radial artery. Femoral systolic pressure equalled or exceeded brachial systolic pressure in all except 1 patient, in whom it remained 10 mm. lower. In 12 cases, measurements were made at operation of the aortic diameter at the site of the anastomosis and proximal to it; even when these were identical, hypertension persisted. COUNIHAN concluded that the more nearly uniform the aortic calibre after the operation, the lower the systolic pressure became—but it always

6. See leading article, *Lancet*, 1956, i, 558.
7. Campbell, M., Baylis, J. H. *Brit. Heart J.* 1956, **18**, 475.
8. Abbott, M. *Amer. Heart J.* 1928, **3**, 574.
9. Reifenstein, G. H., Levine, S. A., Gross, R. E. *Ibid*, 1947, **33**, 146.
10. Crafoord, C. *Minerva Cardioang. Europea*, 1955, suppl. 1, p. 159.
11. Gross, R. E. *Circulation*, 1953, **7**, 757.
12. Cleland, W. P., Counihan, J. B., Goodwin, J. F., Steiner, R. E. *Brit. med. J.* 1956, ii, 379.
13. Counihan, T. B. *Clin. Sci.* 1956, **15**, 149.

remained above normal. WRIGHT et al.[14] examined 10 patients soon after operation and again after periods up to seven years. In most of them the femoral systolic pressure continued to rise slowly, and to a lesser extent the radial pressure fell. As WRIGHT et al. put it, "the residual coarctation" tended to improve slightly during this time, but unlike COUNIHAN's patients, 5 still had femoral systolic pressures significantly lower than brachial pressures after a number of years, and presumably a degree of stricture remained.

Why the blood-pressure does not fall to normal is unknown, but nevertheless what fall there is is sufficient to encourage the belief that the complications of coarctation are abolished or much reduced. The operative risk is still appreciable; and it is unlikely to improve greatly unless resection is advised before the onset of complications, or before the development of degenerative changes in the wall of the aorta make a difficult operation far more so. And even after successful resection, the risk of bacterial endocarditis upon a bicuspid valve remains.

Annotations

INFLATION AND BETTERMENT

IF a Government believe that the nation is in critical danger from inflation, and if they are taking difficult and unpopular measures to check it, there is force in their appeal to all sections of the community not to ask for more money. Stabilisation of the purchasing-power of the pound would be an advantage for which most of us would be ready to pay a considerable price. The policy of our post-war Governments, however, has been directed rather towards slowing inflation than towards stopping it: indeed, if unemployment threatens, we may soon see a degree of reinflation permitted. This policy may be right or wrong; but if money is to go on declining in value—even if slowly—rational and decent means must be found for adjusting remuneration accordingly.

In some countries wages are linked with a cost-of-living index, which alleviates the effects of inflation but also goes far to ensure its continuance. In our own country, too, recent responses to wage claims, when not governed wholly by expediency, have been based on this principle. Thus we have all read with mixed feelings that administrative and clerical staff earning less than £1200 a year in the National Health Service have been awarded "a 3% increase in salary on the basis of the rise in the cost of living since February 1, 1956,"[15] while dispensing assistants have had an increase of 5% to allow for the rise since the previous September.

In commenting on a similar increase of 3% recommended by the Railways Tribunal "to match the rise in the cost of living since the last increase," the *Economist*[16] says that an approximately correct decision has been given for the wrong reasons. Wages can be increased each year, without promoting inflation, provided the percentage increase is no more than that of the nation's real income: thus if (as in a good normal year) the national income goes up by about 3%, everybody's remuneration can go up by 3% without harming the economy. This is in line with our own view[17] that the only satisfactory way of financing the National Health Service is that it should be "accorded, as of right, a defined proportion of each year's national income"—of which in turn defined proportions would be used for paying the various groups of people who work in it. "Betterment," provided the nation continued to prosper, would then be automatic.

MOSQUITOES AND MYXOMATOSIS

MYXOMATOSIS was first described in 1898 in Uruguay,[1] but not until 1927 was the deliberate infection of wild rabbits suggested as a means of reducing their number in Australia. The attempts were only partly successful, apparently because of the absence of insect vectors; for without vectors the disease will spread only when the rabbits are in close contact. After the late war further efforts led to the rapid spread of myxomatosis in the Murray valley. Investigations into the mechanism of transmission then pointed to the rapid dispersal of infection by the movement of infected mosquitoes; and other vectors in Australia were black flies and stickfast fleas. It was thought that the virus did not develop in the mosquito and that transmission was purely mechanical, the insect contaminating its proboscis with virus from the skin lesions of an infected rabbit and transferring it to healthy rabbits up to 25 days later.

In Britain, no officially authorised attempt has ever been made to introduce myxomatosis, but when it had spread quickly across Europe in 1953, it reached England (though by what means is not known) and the first case was confirmed at Edenbridge, in Kent, in October, 1953. By the end of 1955 it had reached almost every parish in England, Scotland, and Wales.

Late in 1954 an investigation began into the possible insect vectors in this country. The rabbit flea is the principal vector, but the activities of mosquitoes were also studied. In the part of the country where the first outbreak took place, by far the most prevalent mosquitoes were the woodland aëdes, and it seemed reasonable to expect that this common mosquito would find a regular and easily available source of blood in the wild rabbit. This possibility was examined by Muirhead-Thomson,[2] who showed that, though aëdes mosquitoes would feed readily on rabbits in the comatose stage of myxomatosis, they seemed reluctant to feed on healthy wild rabbits. By exposing rabbits in cages in woods where the aëdes abounded, it was shown that the mosquitoes were not attracted to healthy domestic rabbits, which remained uninfected despite months of exposure. Though aëdes mosquitoes could be infected with virus by feeding on infected rabbits, their unwillingness to feed on healthy rabbits seemed to make them unimportant vectors of the disease.

In Australia, anopheles mosquitoes have figured largely in the spread of myxomatosis, and the possible rôle of *Anopheles atroparvus*, which is the main vector of malaria in Northern Europe, was also considered[3] in Britain. It proved to be an extremely efficient vector, capable of carrying the infection through the winter, and, theoretically at least, bridging the gap between the virtual elimination of a rabbit population and the appearance of the healthy progeny of an odd survivor. But there is no evidence that anything of this kind does, in fact, happen under natural conditions. One possible explanation is that *A. atroparvus* rarely bites in the open and lives in dark stables, cowsheds, or piggeries for most of the year. But as pigs and stables become fewer, and cowsheds become light and well ventilated, it is becoming increasingly difficult to find this species of mosquito where formerly large numbers would have been expected. *A. atroparvus* prefers the blood of domestic animals to that of wild rabbits, and Muirhead-Thomson concludes that it has little to do with the spread of myxomatosis

14. Wright, J. L., Burchell, H. B., Wood, E. H., Hines, E. A., Clagett, O. T. *Circulation*, 1956, **14**, 806.
15. *Brit. med. J.* Jan. 5, 1957, suppl. p. 12.
16. *Economist*, Dec. 15, 1956, p. 949.
17. *Lancet*, Jan. 5, 1957, p. 31.

1. Sanarelli, G. *Rif. med.* 1898, **14**, ii, 217.
2. Muirhead-Thomson, R. C. *J. Hyg., Camb.* 1956, **54**, 461.
3. Muirhead-Thomson, R. C. *Ibid*, p. 472.

among wild rabbits in Britain. In some places, however, it may help to spread the disease among domestic rabbits; it has been shown that a single bite can infect, and that one mosquito can infect several rabbits in a short time.

Though Australian workers believe that spread by mosquitoes is purely a mechanical transfer, Andrewes et al.[4] have shown that mosquitoes of this species can remain infective for up to 220 days—much longer than was previously thought. The fact that anopheles may remain infective for so long (whereas in the mouthparts of dead mosquitoes the virus survives for only a few days) suggests that there may, in fact, be limited multiplication of the virus. But if there is "biological" transmission, it is certainly very different from that of yellow-fever and insect-borne encephalitis viruses.

METABOLIC RÔLE OF ZINC

THE belief that zinc is essential to normal development rests in part upon the work of Todd, Elvehjem, and Hart,[5] who showed that trace amounts were necessary for the well-being of growing rats; but its fundamental importance to all animals became apparent only after Keilin and Mann[6] had demonstrated that the enzyme, carbonic anhydrase, contains 0·33% of the element as an inherent part of the molecule. Zinc is now known to have other functions, which have lately been reviewed by Vallee.[7]

Of the normal daily intake of 10–15 mg., the greater part is excreted in the fæces; the fraction absorbed maintains a total body store of about 2 g., distributed differentially throughout the tissues. In the plasma, zinc (at a concentration of 124 ± 16 μg. per 100 ml.) is, like calcium, partly bound in non-ionisable form to the plasma-proteins (about a third is in this form), and partly in loose association with protein in an ionisable form suitable for transport. Normal erythrocytes contain 1·44 mg. per 100 ml. of packed cells, and, at least in health, the slight fluctuations in this figure can be correlated with carbonic-anhydrase activity; but no such specific function has been associated with either the protein-bound zinc of the serum or the protein-zinc complex which has been isolated from human leucocytes. Isotopic zinc (^{65}Zn) is rapidly taken up by the liver, kidney, pancreas, and pituitary, but it accumulates more slowly in the bone-marrow and in the circulating red cells. High levels are also found in the retina and iris and in the prostate; and it is known that the element can pass across the placenta.

Besides its part in the carbonic-anhydrase system, there is evidence that zinc, in association with protein, figures prominently in other metabolic changes. The zinc isotope which accumulates in the pancreas is secreted in the pancreatic juice, and this secretion also contains a highly specific carboxypeptidase enzyme which, like carbonic anhydrase, is inhibited by zinc-binding agents. This enzyme has been crystallised as a zinc-protein complex, in which the presence of zinc is essential for activity. Three other enzymes, alcohol dehydrogenase, glutamic dehydrogenase, and lactic dehydrogenase, each dependent on diphosphopyridine, have also been shown to be zinc-protein complexes.

Crystallisation of insulin as a zinc complex has suggested that this element may be an essential part of the active hormone. But the experimental evidence does not support this view; for zinc can be replaced here by nickel, cobalt, or cadmium; and the amorphous form of insulin, which presumably does not contain any metal, has equal physiological activity. Yet zinc undoubtedly modifies the action of insulin, since the addition of zinc chloride to insulin before injection delays the action of the hormone. Reports of a similar action on gonadotrophin preparations are interesting and justify further investigation.

Empirically, it has been found that low serum-zinc levels are often associated with the pyrexia of infection; increased levels are apparently without significance. Serum levels are also low in untreated pernicious anæmia, but as there is no corresponding fall in total erythrocyte zinc, the mean corpuscular zinc concentration rises. In other anæmias, polycythæmia, and leukæmia, the changes in the zinc content of the red cells parallels the hæmatocrit value and the hæmoglobin concentration.

Chemical methods for the determination of trace amounts of zinc are not yet as precise as is desirable in work of this kind. There is reason to hope, however, that new physical methods, including the use of the radioactive isotope ^{65}Zn and the possibility of measurement by flame photometry, may provide a reliable laboratory aid to future advance in this interesting and important field.

TOLBUTAMIDE

THE first sulphonylurea to receive a clinical trial in the treatment of diabetes mellitus was carbutamide (B.Z. 55).[1] The initial German claims that it had a powerful hypoglycæmic action in certain types of diabetes were confirmed, but its limitations also became apparent. It was usually of no value in the young patient with severe diabetes; it was definitely contra-indicated in the treatment of diabetic ketosis; and it was ineffective in the presence of complications such as infection. Further, carbutamide had a definite action on the bone-marrow in a certain proportion of cases, and a special warning was issued about this danger.[2] Other less serious side-effects included skin rashes and interference with thyroid function.

The second sulphonylurea to be investigated was tolbutamide, which has a methyl group in place of the *p*-amino group of carbutamide, and many reports have now appeared.[3] There are certain differences in pharmacological properties between carbutamide and tolbutamide. The hypoglycæmic effect persists, though tolbutamide is slightly less active,[4] but the bacteriostatic action is lost.[5] Of greater importance is the question of bone-marrow toxicity, and this is always more difficult to assess. The dangers of carbutamide in this respect were not fully appreciated until some time after its introduction. The evidence so far suggests that tolbutamide is considerably less dangerous than carbutamide, though it is not entirely innocuous since it too may produce leucopenia.[6] Both substances suppress the uptake of radio-iodine, but tolbutamide is less active in this respect.[7–12] Clinically this side-effect has not so far been important, but clearly this anti-thyroid action must be borne in mind if lengthy treatment is needed. Skin

4. Andrewes, C. H., Muirhead-Thomson, R. C., Stevenson, J. P. *Ibid*, p. 478.
5. Todd, W. R., Elvehjem, C. A., Hart, E. B. *Amer. J. Physiol.* 1934, **107**, 146.
6. Keilin, D., Mann, T. *Biochem. J.* 1940, **34**, 1136.
7. Vallee, B. L. *J. Amer. med. Ass.* 1956, **162**, 1053.

1. See *Lancet*, 1956, ii, 180.
2. Duncan, L. J. P., Nabarro, J. D. N., Oakley, W. G., Wolff, F. W. *Brit. med. J.* 1956, ii, 454. See also Page, O. C., et al. *New Engl. J. med.* 1957, **256**, 74.
3. Levine, R., Duncan, G. G. *Metabolism*, 1956, **5**, 721.
4. Beaser, S. B. *Ibid*, p. 933.
5. Moreau, R., Deuil, R., Sarrazin, A., de Traverse, P. M., Martinet, M. *Pr. méd.* 1956, **64**, 1261.
6. Fulmer, H. S., Dube, A. H., Lloyd, C. W. *Metabolism*, 1956, **5**, 940.
7. Renold, A. E., Winegrad, A. I., Froesch, E. R., Thorn, G. W. *Ibid*, p. 757.
8. Brown, J., Solomon, D. H. *Ibid*, p. 813.
9. Mortimore, G. E., Di Raimondo, V. C., Forsham, P. H. *Ibid*, p. 840.
10. McGavack, T. H., Seegers, W., Haar, H., Erk, V. *Ibid*, p. 919.
11. Kuhl, W. J. *Ibid*, p. 953.
12. Heineman, A., Cohn, C., Weinstein, M., Levine, R. *Ibid*, p. 972.

rashes are occasional complications with both carbutamide and tolbutamide.[12 13]

The hypoglycæmic action of the two drugs apparently depends on the same principle[14]; and there is no evidence that a diabetic patient who does not respond to one compound will react favourably to the other. The way these substances produce hypoglycæmia is still uncertain, and the position has not been greatly clarified since we commented[1] on this subject six months ago.

There are certain characteristic differences between the actions of insulin and sulphonylurea in producing hypoglycæmia. Insulin increases the glycogen content of muscle, unlike sulphonylurea, which, on the other hand, increases hepatic glycogen.[15 16] It is thought that the sulphonylureas may act by decreasing the release of glucose from the liver[7 17]; but this view is not universally accepted. These compounds are ineffective after total pancreatectomy, but small doses have a definite hypoglycæmic action when injected into a pancreatic artery. No effect on the blood-sugar level follows injection into the portal vein.[18] Other evidence points to the fact that they can act only in the presence of some functioning pancreatic tissue and supports the view that tolbutamide has a direct action on the islets of Langerhans.[19]

The persisting uncertainty about both the mechanism of action and the hazards of long-continued administration means that the use of tolbutamide should be restricted to carefully planned therapeutic trials. Its widespread use, even in the type of diabetes that might respond, is certainly unwise. Many of the patients who might respond are overweight and can often best be treated by dietetic measures alone. In more severe cases the attraction of treatment by mouth should not outweigh the fact that insulin is still the physiological replacement.

PESTS AND PESTICIDES

MANY chemical substances used to control insect pests and plant weeds are toxic to man and other mammals; and the widespread use of these substances is an occupational hazard to sprayers and factory workers. There is also a potential danger to the general population from food which may contain minute amounts of these substances, applied at some stage during its growth, preparation, or preservation. These problems have been recognised by many governments, and the views of an international panel of experts, set up under the auspices of the World Health Organisation, have lately been published.[20] Chemically, the pesticides fall into two large groups: the chlorinated hydrocarbons, which include dicophane (D.D.T.), chlordane, dieldrin, and endrin; and the organophosphorus compounds, of which parathion, T.E.P.P., malathion, and chlorthion are examples. The mechanism and the symptoms of poisoning are quite different in the two groups, but the fundamental actions of individual members of each group are similar.

Those who are anxious to have the most effective materials they can get must also ensure that these can be used with safety to both man and animals. Clearly, information on the toxicity, safe methods of use, and the treatment of poisoning must be readily available before effective field programmes can be planned. Animal experiments provide basic information on comparative toxicity. But the methods of applying an insecticide in different environments may result in unexpected poisoning. Thus, dieldrin poisoning has been troublesome among workers in Venezuela, where it is used to control the vector of Chagas's disease, but dieldrin has been used in Africa and Indonesia for malaria control with no untoward effects. For several reasons, the difficulties of getting up-to-date information, and therefore of controlling adequately the use of insecticides, have become greater during the past few years. An increase in the number of insect species attacked and the development of resistance by the insects have led to an increase in both the quantity and variety of chemicals used. In 1946 resistance was reported in only 1 species of insect, but by 1956, 34 species were known to be resistant to these insecticides—a change which emphasises the need for laboratory investigation and careful field studies before making recommendations about the use of such substances.

The clinical signs of early poisoning by either the organophosphorus or hydrocarbon compounds are not specific. The late signs of poisoning by organophosphorus compounds are due to the accumulation of acetylcholine at nerve ganglia and motor end-plates of muscles—muscle fasciculation, bronchospasm, abdominal pain, terminal convulsions, and coma. In serious poisoning by the chlorinated hydrocarbons, there is incoördination of movement, irritability, with intermittent clonic-tonic convulsions, and finally respiratory failure. Specific tests can establish the diagnosis of poisoning by the organophosphorus compounds (depression of the blood-cholinesterase activity is a characteristic action of this group). But no satisfactory laboratory test has yet been devised for detecting poisoning by any of the chlorinated hydrocarbons, except dicophane. In dicophane poisoning, dichlorophenylacetic acid (D.D.A.) is excreted in the urine.

The routine animal experiments which are carried out before any new substance is recommended as a pesticide may also throw light on the mode of action of the new compound. It is often found, however, that laboratory animals show considerable species differences in their susceptibility. The W.H.O. report recommends that greater emphasis be given to studies of human beings who have been exposed to pesticides; and the report also devotes many pages to the discussion of measures for the protection of operators handling pesticides. Points of particular importance are that the workmen should be made fully aware of the risks involved, and if men exposed to organophosphorus compounds are found to have a low blood-cholinesterase level, further exposure must be forbidden even though no symptoms or signs of illness are apparent.

Though the amounts of pesticides present in milk, flour, meat, fats, and water are insufficient to produce symptoms of acute or chronic poisoning, no-one knows what damage may follow the continued absorption of small amounts over long periods. For this reason volatile chemicals should be used as far as possible and the amount applied should be kept down to a minimum. It is known that dicophane, dieldrin, and gammabenzene hexachloride are eliminated in the milk of lactating animals, and dicophane has been found in human milk. For this reason, these substances should not be used as insecticides in dairies or be added to cattle feeding-stuffs. Another consideration is the effect on domestic animals and fish—for example, when applying insecticides for the control of malaria or molluscicides for the control of bilharziasis, the concentration of insecticide in the water must be well below the level which would harm the fish. The W.H.O. study group decided that no recommendations could yet be made about the maximum safe limits for residues of pesticides on food, because of the shortage of reliable information.

13. Unger, R. H., Davidson, J. W. *J. Amer. med. Ass.* 1956, **162**, 447.
14. Beringer, A., Kelbl, E. *Wien. med. Wschr.* 1956, **106**, 792.
15. Miller, W. L., Dulin, W. E. *Science*, 1956, **123**, 584.
16. Wick, A. N., Britton, B., Grabowski, R. *Metabolism*, 1956, **5**, 739.
17. Purnell, R., Aral, Y., Pratt, E., Hlad, C., Elrick, H. *Ibid*, p. 778.
18. Colwell, A. R. jun., Colwell, J. A., Colwell, A. R. *Ibid*, p. 749.
19. Goetz, F. C., Gilbertsen, A. S., Josephson, V. *Ibid*, p. 788.
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Special Articles

INDIVIDUAL REACTIONS TO CHANGE
AS SEEN IN SENIOR MANAGEMENT IN INDUSTRY*

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IN these days the idea is current that the greater part of nervous breakdown is due to intimate rather than external causes. But many psychiatrists are now coming to believe that stress related to the simple business of living and working may be of at least equal importance. And of the breakdowns which occur, a great number are directly related to a failure to adapt successfully to change, or the need for change. For this reason management is a most promising field for mental hygiene.

Man, we learn from the *Koran*, is incapable of perfection; and, in its low level of accuracy and large number of errors, human performance compares ill with that of most forms of machinery. This, however, is the price we pay for two qualities in which the human organism far excels any machine of its creation—namely, *complexity*, and the capacity for *self-regulation and profiting from experience*. In man alone there have developed from these qualities such attributes as initiative, foresight, responsibility, and appreciation of human relationships. But unfortunately these attributes, which are essential for leadership in any major enterprise, remain scarce, and they are very unevenly distributed. That their correlation with intelligence in the academic sense is relatively low explains many of the mistakes in personnel selection.

Like man, industry must adapt to changing conditions. Within its organisation it will have a considerable division of labour, and, in terms of cybernetics, will include regulators, discriminators, predictors, and integrators, linked to a certain number of generalisers. It is the generalisers that are responsible, ultimately, for the direction of change; and the future of industry depends on their selection, training, and distribution, in place and time, and on maintaining the fickle flame of their efficiency—for they are only human.

One of the trends in business organisation is the increase in the proportion of administrative to operational staff. If twenty men, drawing only moderate salaries and working at half pressure, could be as effective as ten men working at full pressure, this might not matter so much, but it is not so. If they can be obtained, a smaller number of men earning more pay and doing much more work in the same time will produce far better results.

INSECURITY

It is with the causes of inefficiency in the components of the regulating mechanism—the senior managers and directors—that I shall now deal.

If I have any complaint of boards of directors or groups of senior executives it is that they are far too considerate when one of their number falls into my hands. Their consideration often takes the form of concern lest he should lose his job and the dignity and authority that go with it. They will bemoan the pace of modern industry, and, if given the opportunity, they will furtively compare the patient's case with their own. These men have recognised that it may be their turn next. The strain of doing a job for which they are no longer fit, their determination to hang on to what they have got, is written all over them. They are insecure. In my view their value as generalisers is often limited, for they share with the neurotic the urge to save their own skins. If the generaliser is no longer able to identify his own aims with those of the firm in an enlightened self-interest, if he is preoccupied with holding on to his personal status and the status quo, this attitude will extend to his work and he will, albeit unconsciously, resist change.

Most people in industry are well adjusted, preserve a good balance between their industrial and private lives, and generate no unhealthy inward tension, so that if their task is well designed for them, and if it is one that gives an opportunity to make use of their abilities, attitudes, and interests, they will work at maximum efficiency. In their case modification of their work may create a temporary but healthy tension which has the function of keeping them alert during the period of adaptation. In those who are less well adjusted, however, even the suggestion of change and the threat of being called upon to do or to understand something beyond their abilities brings the threat of breakdown. They are unable consciously to accept the reasons for their uneasy feeling about the new idea, and rationalise their position and convince themselves that "all change is perilous and all chance unsound." Their response is not always clearly evident. They may in fact appear very enthusiastic until the implications of the proposed change in terms of personal reorientation have sunk in. The delayed change of heart after a day or two is a known characteristic of this group.

Among those in senior positions in an organisation, the tendency to hold on to power as such is apt to increase as real capacity diminishes. Use is frequently made by the insecure of the fact that the man who is trying to get a new idea across has to use many times as much energy as the man who wishes merely to obstruct him passively. The sense of power through refusal, learnt in the cradle, is experienced again with new and ego-sustaining satisfaction.

Where resistance to change is of emotional rather than rational origin, the ways of overcoming it may sometimes have to be oblique in the extreme. If one is to be a bringer of change and progress, a good deal of time has to be spent on just this process, for a cause will rarely sell itself entirely on its own merits. Means must constantly be found for providing spiritual gain for those who are to support it.

MATURITY AND INERTIA

Only a small proportion of humanity has the capacity, the energy, and the wish to act as generalisers. Yet many find themselves either thrust into this position or are there by a passive operation of promotion. The human brain, in the most intelligent groups, is not mature until the age of 25, at which time there is still much more to be learnt. But after 25 there is a very slow decline in the speed of thought and the capacity for learning. Between 25 and 35 the seeds of a man's best ideas are laid down, even if they flourish much later. After 35, maturity and experience must compensate for the gradual but definite slowing of mental activity which is taking place. A few, with sound brains and well-trained habits of mind, can maintain their originality well into the senium, but in one whose ability has never been adequate, or whose decline has been more rapid than usual, the mental mechanisms by which he keeps up with his work and conceals the truth from himself and others are fully in operation by 40. The most powerful weapons protecting him are *tradition* and *promotion by seniority*. Too often the advice which should be given to a firm is: "It would be economical to pension this man off generously—to pay him to stay away." But by that time of life the currency acceptable to him is not so much cash as prestige.

* From an address to members of the Duke of Edinburgh's study conference on the Human Problems of Industrial Communities within the Commonwealth and Empire, July 14, 1956.

It is unfortunately not yet possible to get spare parts for the human machine, and the brain in particular can lose components but never replace them. Nor can one easily scrap the machine and find a new one at once; for it takes time to train a senior manager for the particular needs of the organisation he is to control. I should not like to give the impression that I always consider the more change the better, or think that continual change is necessarily healthy. On the contrary, the formation and maintenance of stable routines is an essential. But it is evidence of high morale in a human group that there is no mental set against the possibility of change, that new thought can be generated without having to overcome too much inertia of mind and that the capacity to adapt to change has not been lost. In the same way continual changes of staff as well as methods may have an adverse effect on morale. There seems, however, to be nothing whatever to be said for inbreeding at the top end of management, and the practice of introducing chairmen and heads of departments from outside must surely keep managers in competitive trim. If a firm, through such a policy, tends to lose personnel because they cannot feel secure, the loss in experience may be made up by a gain in initiative.

THE RESPONSE TO STRESS

Breakdown occurs in both the successful and the unsuccessful, and in that the former adapt better to change, their outlook is usually better. In fact some very successful men with a very sure touch in their business affairs require in their private lives to be propped up by psychiatrists, astrologers, diets, and wives, and this is clearly worth doing.

A feature of some successful executives is the intermittency of their drive. They will accomplish a great deal in a few short weeks, after which they are less in evidence until another quantum of energy is available. It is characteristic of them that they respond to change, even when they have not themselves initiated it, with a burst of energy. Their moods are often quite predictable to their secretaries, though not to themselves. This intermittency is consistent with a high intellect and is a liability which those gifted with the ingredients of success must often accept. Few are able to live through an active progress to senior positions without showing some signs of strain; but these are usually self-limiting.

Inability to adapt to one's circumstances creates a sense of inadequacy, of inward tension and insecurity. This tension, which may be brought about by many other kinds of psychological stress, is the common basis of neurotic breakdown. Where a person can face his own inadequacy—be he ugly, clumsy, stupid, or merely lacking in drive—and change his circumstances, even at the loss of prestige or pay, so that he can cope with them, he will not break down. Perhaps I should say, *would* not break down, for I have yet to meet him. One and all, we are bolstered up by self-deceptions and comforting ideas which we are not in the habit of examining very carefully.

Some causes of tension in managers are:

(1) Sudden change to a task requiring rapid and complex adaptation in a man who has been too well organised for too long.

(2) Failure to accept with resignation a position inconsistent with ambitions.

(3) Decline of ability to keep up with a job which is too responsible and calls for more initiative than can be found without strain.

(4) Conflict between identification with firm's interests and competing interests at home.

(5) A degree of intermittency in drive which has allowed the individual to take on more when "high" than he can cope with when "low."

(6) The cumulative effects of a type of drive which makes delegation difficult and prevents a reasonable relationship of work to leisure.

(7) Increasing uneasiness at the prospect of retirement for which no mental preparations have been made.

The tension generated shows itself in various ways, all of which have an indirect effect on efficiency:

(1) Poor sleep; bad temper; continual grumbling; longer hours of work but less achieved. Symptoms usually attributed to overwork.

(2) Repeated minor sickness. Consulting specialists and self-medication, often accompanied by an interest in life-assurance and financial security.

(3) Procrastination. Working from in-tray to out-tray and losing sight of long-term aims. Working by the clock rather than by the interest of the job.

(4) Feeling of frustration and persecution by colleagues. Complaints of lack of coöperation.

(5) Increase in alcoholic intake and verbal output. Technical jargon and catch-phrases replace original thought.

There is a tendency to underrate the importance of alcohol as a contributory cause in breakdown at the senior levels. It provides a readily available and socially acceptable escape from the sense of insecurity, and the premium put on extraversion and interpersonal relations in business predisposes to its use in excess. There might be some question whether firms are getting their money's worth out of the bonhomie generated by their expenditure under this heading.

BETTER SELECTION AND ALTERNATIVE PLACEMENT

How is it possible to bring into the regulating mechanism of a firm a sufficient proportion of people who are capable of exercising foresight and of applying it in the form of change? Also to get them into this position while in their prime and to get them out of it before the onset of the *defensive decline* described above, if they are not capable of keeping up the pace. Two possibilities at least are worth considering—*better selection*, and *alternative placement* for those whose initiative is waning.

Managers capable of going to the top are scarce. Probably, in the immediate future a lower proportion will come from the universities, for these are at present saddled with an excess of expert examinees, intellectually precocious but immature in character, who have had (in relation to their contemporaries) their peak performance in the years between the "eleven-plus" and the General Certificate of Education. It is fortunate that industry is offering opportunities to those who have failed to get into universities and who have reached maturity on the job. There are also the sons of middle-class parents who (because of taxation or the means test for educational grants) cannot be sent to the university but can be accepted for training in industry from the outset. Again, the technical and research branches of industry can contribute a large quota to senior management. A firm which can take ten possibles, and, having given them all special opportunities for rapid training, can produce one first-class manager, is not making a bad bargain if three more can find satisfactory places lower down in the pyramid.

Though they are fallible and have caused disappointment, selection methods can help. Applied psychology is still inclined to lay too much stress on brightness as opposed to other less measurable qualities. It is apt, too, to be excessively preoccupied with the exclusion of those who may actually break down as opposed to those who will merely be inefficient and who in fact are far more expensive in the end. But that some organised selection is better than none is now being realised by those firms who are getting the left-overs from those who do select. Selection does not have to be 100% successful to be a good investment.

The selection of the future administrator is a continuous process, and while a promising entrant is learning his

job he must be frequently re-assessed, for there is no method of selection as reliable as the long-term observation of the individual's reaction to a succession of real situations. There is no reason why it should not be recognised as continuing throughout his career in industry.

Senior managerial staff who are unable to maintain initiative may be valuable in a position in which they can use their experience. In the larger organisations it should be possible to have a staff structure designed so that those who have a chance to go on to the very top should not be as well paid as those who, having got so far in the general administration, may prefer to take a more specialised post with higher pay, earlier retirement, and as high-sounding a title as is considered possible. The way to the top would thus be hard, with the option at any time of compromising for the more specialised but more lucrative post with less influence on general policy.

There remains the problem of the inadequate but ambitious, the dogs in the administrative manger. Experiments with methods by which members of a group of seniors make an annual report, without consultation, on the fitness of each of their colleagues, are of great interest in this country, because when a Briton is asked to pass judgment of this kind he usually will do his best to be objective and will not at once seek to form a voting bloc. The results of such experiments, carried out with due care for secrecy and anonymity, indicate that the method might be useful if it became the established custom to ask for assessments of this kind and to correlate them statistically over a period of years. While it remains the custom to "carry" those who have become drunken, idle, or prematurely incompetent the cost will remain high. Financial security is desirable as age advances; but to assure personal prestige as well as material security is more than the economy can bear.

From the point of view of one whose news of the battles of industry is mainly derived from the casualties left on the field, it appears that the ideal of management is a body of individuals who see their own advancement, and the satisfaction of their personal drive, in pursuing the aims of their organisation, who are conscious of the responsibility of recruiting young men to their number on a basis of merit alone, and who have an established system of using the experience of those who can no longer stand the pace of change. As the pace of competitive industry accelerates there can be no room for traditional self-deceptions, and direction must surely be placed in the hands of those who can not only accept but will welcome change.

CLUBS FOR "MIXED" HANDICAPS

MOST of the voluntary organisations for the disabled have been formed to help people with a particular handicap or disease. Thus there are societies which look after the welfare of spastics, of people with poliomyelitis, or of the blind. The St. Raphael Clubs are unusual in that they are open to nearly all handicapped people, from teenagers to old-age pensioners, regardless of their disability.

The first club was started ten years ago by the parents of some handicapped children in Norwich. The name was chosen because the angel Raphael was sent to help the sons of Noah in their adversity. Ten clubs have now been set up, including those at Hexham, Romford, King's Lynn, Colchester, Swaffham, Lowestoft, and Wayland, a rural area of Norfolk.

The clubs offer recreation and social help to handicapped people. The limitations of disability are lessened by the fun and satisfaction of doing things (however small) together, and of meeting old friends and making new contacts—not always an easy thing for the disabled. Companionship underlies everything done in every St. Raphael club. A one-ailment club can breed an odd sort of preoccupation. But at a St. Raphael club the patient with poliomyelitis, for instance, is shown the problems and courage of spastics, arthritics, and the blind.

The clubs are run as much as possible by the members themselves, but much of the work is of course done by the least handicapped and by able-bodied supporters. Surgeons, almoners, and occupational therapists help with their special knowledge; organisations such as the Red Cross, the Churches, and the W.V.S. help in many ways, and transport is provided by Rotary and Round Tables.

The Norwich club has a membership of 110 and an average attendance of 75 at its weekly meetings. It has its own premises, a small redundant school which was bought a few years ago after great efforts by the members and their supporters. There is a large hall, now complete with piano and stacking chairs, a small lounge with easy chairs and a television set (given by the local Round Table), a room with a billiard-table and workshop tools, and a kitchen. Other organisations of handicapped people, such as the Invalid Tricycle Association, are allowed to use the rooms when free. On Saturdays the club is open from 3 P.M. until after 9 P.M. Older members hold their weekly meetings on a different day from the younger generation. Entertainments vary from film shows and outings to concerts and short plays. A small choir leads a monthly religious service held by members and their friends. Some members make and sell toys, and for the past two years the club has held a competition and exhibition of handicrafts, to which the other St. Raphael clubs have contributed. It has also found jobs in offices for several members, and a local firm has provided piecework to be done at the club itself.

The Hexham and Wayland clubs serve country areas, and their membership is less than 50. But the need they meet is perhaps even greater than in larger towns. Thus the Hexham club includes blind people, who in Norwich, where the numbers are larger, have an organisation of their own.

Each club is recognised by the authorities for the receipt of grants. Members pay 6*d*. per meeting—held weekly in Norwich, monthly in the smaller clubs. For blind members there are special grants.

Public Health

Nursing-homes in London

THE report for 1955 of the medical officer of health for the county of London [1] includes an account, by the late Dr. E. B. Argles, of nursing-homes in the county. Whereas in 1937 170 nursing-homes were registered, the number had fallen to 108 in 1945, 63 in 1947, and 48 in 1953. Rising costs, says the report, have alarmed the users as well as the owners of nursing-homes. Accommodation which before the late war cost 5–8 guineas a week today costs 11–25 guineas; but this is not a disproportionate increase when compared with rises in costs.

Confinements in nursing-homes numbered 1091 in 1952, compared with 3167 in 1947. This large drop is not due wholly to the fall in birth-rate from 20·9 per 1000 population in 1947 to 15·3 per 1000 in 1952. Most homes have found that in the post-war years less use has been made of their operating-theatres, whereas more beds are being used for medical cases and particularly for the treatment of chronic sick or senile patients. "Establishments which provide care for the aged by ordinary unskilled staff fill a real need, and there are good reasons why some of the smaller nursing homes should turn their attention to this type of elderly person who so often fails to find the accommodation for which he or she is seeking."

1. London County Council: Report of the County Medical Officer of Health and Principal School Medical Officer for the Year 1955 Issued from County Hall, S.E.1. Pp. 193. 2*s*. 6*d*.

Before Our Time

"DOCTOR"

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THE word "doctor" has no less than twelve different meanings, but only two of these concern medical men [1]—a degree in a university and the name given to a medical practitioner.

As a degree it was first used in the medical school of Salerno [2] about the middle of the 11th century. It was next used in the law school of the University of Bologna [2] in the middle of the 12th century as a degree superior to that of magister, and soon afterwards it was introduced at Paris,[3] first in the divinity school and later for law and medicine. Oxford University,[3] which was founded about 1167, gave a doctorate in divinity, and sometime in the 13th century one in law and medicine. Cambridge University,[4] which was founded about 1209, also gave a degree of doctor in these subjects. Until the University of Durham was founded in 1832 these were the only two universities in England which could grant the degree of doctor in physic; but the other universities in the British Isles—St. Andrews (founded in 1411), Glasgow (1451), Aberdeen (1494), Dublin (1591), Edinburgh (1583)—all gave degrees in medicine.

At the present time Oxford confers the degree of doctor in seven faculties. An estimate of the respective numbers in each faculty, obtained from the University Calendar, is: divinity, 99; civil law, 31; medicine, 234; letters, 58; science, 68; music, 29; philosophy, 883. The total of these figures (1402) is probably on the low side, since if the doctor removes his name from the "books" it is omitted from the calendar. But it will be seen that of some 1400 who have a doctor's degree and can call themselves Doctor, fewer than 250 are doctors of medicine.

Outside the universities, degrees in divinity, civil law, and medicine were formerly conferred in this country by the Pope. After Henry VIII assumed the post of "Supreme Head of the church and clergy as far as the law of Christ will allow" (Act, 25 Henry VIII, c.21) in 1534, these powers were transferred to the Archbishop of Canterbury, and the degrees are now called the Lambeth doctorates.[5] Thomas Cranmer did not confer any degrees in medicine, but, of the 451 Lambeth degrees given between 1663 and 1848, 31 were in medicine and 13 of the recipients do not seem to have had a medical qualification. The last degree in medicine was conferred in 1880.[6]

The other common use of the word is for a medical practitioner, and its first recorded use is by Langland.[1] Chaucer used it in 1386, saying "With us ther was a Doctour of Phisyk."[7] The older word for a medical practitioner was a leech, and this is noticed as early as the year 900.[1] Chaucer said in 1386 "What nedeth hym that hath a parfit leche To sechen other leches in the toun."[1 8] Both words seem to have been used in the succeeding centuries, but in the 17th "leech" was applied to veterinary practitioners.

* * *

When the Royal College of Physicians was founded in 1518, its fellows and licentiates did not call themselves Doctor unless they had the degree of doctor of medicine in either Oxford or Cambridge or one of the universities in the British Isles.

Surgeons about this date in London were members either of the Barbers Company, which contained both barbers and surgeons, or of the Guild of Surgeons which was less influential and poorer than the Barbers Company.[9] These two united in 1540 when Henry VIII granted a charter to them as the Barber Surgeons Company.[9] The members of the company rarely if ever had the degree of doctor of medicine and did not call themselves Doctor. The Surgeons separated from the Barber Surgeons Company in 1745 and formed their own company. This was dissolved in 1796 and a royal charter was granted to the new College of Surgeons in 1800. During the 360 years since the foundation of the Barber Surgeons Company, few surgeons would have had the degree of doctor of medicine, and surgeons would not have been addressed as Doctor.

The rise of the apothecary began to cause difficulties in the profession. An Act of Parliament in 1815 gave the Society of Apothecaries the right to appoint a court of examiners to examine all apothecaries to ascertain the skill and abilities of such persons in the science and practice of medicine and their fitness to practice as an apothecary. Further, in 1827 the society asked for proofs of training in midwifery which neither of the Royal Colleges demanded, so that the holder of the diploma of L.S.A. might have had a better all-round qualification than the licentiate of the Royal College of Physicians or the member of the Royal College of Surgeons. Between the years 1815 and 1883 no fewer than 31,000 men were licensed to practise by the Society of Apothecaries and it was thought that five-sixths of the London students in 1822 were studying for general practice as surgeon apothecaries.[10] Many of these men, who were not licentiates of the Royal College of Physicians, called themselves Doctor, and this custom caused a good deal of ill feeling, especially when the Medical Act was passed in 1858. This Act required, among other things, that all should register their qualifications with the General Medical Council. *The Lancet*, the *British Medical Journal*, and the *Medical Times* of 1860 contain many letters complaining that licentiates of the Society of Apothecaries called themselves Doctor whereas those of the Royal College of Physicians were not allowed to do so—which made the general public tend to regard the licentiate of the Society of Apothecaries (L.S.A.) as superior to the licentiate of the Royal College.

The matter was brought to a head when an action was brought against Hubert Edward Kelly, who lived in Pinner, because, although he had registered only the qualifications of M.R.C.S., L.S.A., he styled himself Doctor. The action was dismissed by the magistrate and was heard on appeal in the Court of Exchequer before the Lord Chief Baron and two other barons. The Lord Chief Baron, in dismissing the appeal, said "If a man is registered, he may call himself what he pleases," and "the Act (Medical Act of 1858) is to prevent any man practising medicine who is not registered."[11] This case was complicated by Kelly having produced documents which showed that he had the degree of Erlangen University; and, though he had not registered this degree, he was clearly entitled to call himself Doctor.

The Royal College of Physicians paid no attention to this decision, and in 1862 published its by-law in English which said:

"No Fellow, Member, or Licentiate of the College shall assume the title of Doctor of Medicine or use any other

1. New English Dictionary.
2. Rashdall, H. Medieval Universities (edited by F. M. Powicke and A. B. Emden). London, 1936; vol. i, pp. 76, 87, 271.
3. *Ibid*, vol. iii, p. 11.
4. *Ibid*, p. 277.
5. *Lancet*, 1896, i, 1146.
6. Private communication from the Librarian, Lambeth Palace.
7. Chaucer, G. (1386). Complete works (edited by W. W. Skeat). Oxford, 1894. Prologues, line 411.
8. *Ibid*, Somnour's Tale, line 248.
9. Young, S. Annals of the Barbers Company. London, 1890; p. 47 et seq.
10. Horner, N. G. The Growth of the General Practitioner of Medicine in England. London, 1922; p. 36.
11. *Lancet*, 1860, ii, 524.

designation, name, title, or distinction implying that he is a Graduate in Medicine of a University, unless he be a Graduate in Medicine of a University." [12]

There the matter rested until after 1884 when the two Royal Colleges agreed to set up a Conjoint Board to conduct the examinations in medicine, surgery, and midwifery under conditions which satisfied the requirements of the General Medical Council and to grant a Conjoint diploma.[13] Having done this, the two colleges considered whether they could not grant a degree instead of only a diploma. Their proposal was rejected in 1889 by the Royal Commission upon the Higher Education in London.[14] Two years later a proposal to delegate "pass degrees" to a joint board, nominated partly by the senate of London University and partly by the two Royal Colleges, was rejected by convocation.[15] Three years later the two colleges approved a plan to found a second university in London, to be called the Gresham University, which would have been a teaching university independent of London University.[16] This scheme was eventually rejected by a Royal Commission in 1900 when a new constitution was granted to London University. The two colleges were each given two representatives on the senate, and under the constitution "powers were granted to the Senate to make arrangements to conduct jointly with the Senate examinations in such portions of the subjects in the course of study for a medical degree as may be agreed upon between the Senate and those Colleges." (Statute 123).[17] This statute has never been acted on, and after careful consideration in 1903,[18] and again in 1910 and 1911,[19] the Royal College of Physicians "decided that it was inadvisable that the College should take any further steps to promote the scheme of a Conjoint Examination contained in the report dated 1910." This ended the efforts of the twenty-six years on the part of the two colleges to grant degrees to their licentiates and members.

In 1905 the secretary of the Royal College of Surgeons wrote to the Royal College of Physicians saying that his college received many complaints from its members about the by-law forbidding them to use the title of Doctor, and hoping that the Royal College of Physicians might see its way to withdraw its prohibition.[20] The matter was carefully considered by the Royal College of Physicians but in April, 1906, the comitia decided by a large majority to make no change in its by-law.[21] However, in July, 1911, the comitia again considered the matter because of more complaints by its licentiates and because of the impossibility of preventing licentiates from using the title of Doctor if they defied the college. As a result the by-law was amended in 1912 [22] and now reads:

"No Fellow, Member or Licentiate of the College shall append to his name the title of Doctor of Medicine or the letters M.D., or any other letters indicating that he is a Graduate of a University, unless he has obtained a degree entitling him to do so."

The meaning of the by-law may be summarised in the words which the Chief Baron used in 1860: "If a man is registered he may call himself what he pleases." At the time the by-law was passed the whole medical profession and its press was deeply concerned with the struggle over the Lloyd George National Insurance Act, and *The Lancet* did not comment on it until nearly five months later.[23] The concluding sentence of its annotation runs:

"Previously the distinction between practitioners who did or did not hold University degrees was rather an invidious one as it tended to the idea that their professional skill and knowledge were similarly unequal, which was by no means necessarily the case: now without fear of any reproach for using a forbidden term, the Licentiates of the Royal College of Physicians and the Members of the Royal College of Surgeons can adopt the professional title which is generally understood by the public to indicate that they are duly qualified practitioners of medicine."

* * *

Now that forty-four years have elapsed since the by-law was altered, the general practitioners all call themselves, or are called by their patients, Doctor, whether they have the degree of doctor of medicine or not. The newly qualified house-officers are treated in a very unequal fashion. In some teaching hospitals both the house-physician and house-surgeon are called Mister. In others the house-physician is called Doctor and the house-surgeon Mister. In the great majority of non-teaching hospitals, I understand that, both are called Doctor, though in some the house-surgeon is called Mister. Although the Royal College of Surgeons had striven so hard to get the by-law altered so that its members might be called Doctor, its fellows and those of the sister college of Edinburgh refuse to be called Doctor and insist on being called Mister, as though that were a superior degree.

This curious practice, which does not exist in any other country (so far as I know), except in those Dominions of the British Commonwealth which follow the practice of the Royal College of Surgeons, seems to arise from the old antagonism between the Royal College of Physicians and the Barber Surgeons Company after its formation in 1540. The members of the company rarely if ever had a degree of doctor of medicine, and their general education was certainly inferior to that of the physicians. Further, judging by the rules which William Harvey, in 1633, laid down for them at St. Bartholomew's Hospital, they were under the domination of the physicians.[24] Nowadays, when the general education and qualifying examinations are perforce the same for both physicians and surgeons, it seems peculiar that the distinction should still exist, and that the surgeons should still seek to preserve the insignia of their inferiority in the Middle Ages. This practice seemed most peculiar when an elderly anæsthetist (now dead), who had always been styled Doctor, was elected a fellow of the Royal College of Surgeons and insisted on being addressed as Mister. The fellows of the Royal College of Obstetricians and Gynæcologists, and all who aspire to become Members of that College, also refuse to be called Doctor and seem to glory in being called Mister. This is more difficult to understand seeing that fifty years ago they all called themselves Doctor. The custom seems to have started about the time of the foundation of the college and it is difficult for an elderly physician, who is proud to call himself Doctor, to understand why the change was made.

The practice causes a good deal of confusion among patients and the general public, who cannot understand why a properly qualified doctor should not be so called. It also causes some inconvenience to themselves if they travel in countries where all medical men are called Doctor. Is it too much to hope that one day everyone who has a registrable qualification will be called Doctor and that this curious survival will cease?

I have to thank the Registrar, Sir Harold Boldero, for permission to consult the Annals of the Royal College of Physicians of London, and Mr. L. M. Payne, F.L.A., for his great assistance in searching the records.

12. Annals of the Royal College of Physicians of London, 1862.
13. *Lancet*, 1884, ii, 741, 972.
14. *Ibid*, 1889, i, 1855.
15. *Ibid*, 1891, i, 1110.
16. *Ibid*, 1894, i, 967.
17. *Ibid*, 1900, i, 550, 558.
18. Annals of the Royal College of Physicians of London. 1903.
19. *Ibid*, 1910, 1911.
20. *Ibid*, 1905.
21. *Ibid*, 1906.
22. *Ibid*, 1912.
23. *Lancet*, 1913, i, 1255.
24. Moore, N. History of St. Bartholomew's Hospital. London, 1918; vol. ii, p. 491.

In England Now

A Running Commentary by Peripatetic Correspondents

THROUGH hell and high water we uphold the cause of Freedom. In our mountain fastness we are quite used to swinging our little motor-cars around the hairpin bends and down the 1 in 4 gradient that leads to the village. We do not clutter up the valley with warning signs and suchlike cossetting. Our cats' eyes blink contentedly by the hearth, our white lines stay by the dartboard. We have the room and the time to enjoy the pattern of sunlight on the fells, to swerve round the sheep in the road, to stop for a chat on the corner. We would be thought plain daft if we waggled our arms about with fancy signals as it says in the *Highway Code*. Likely cause a nasty accident.

The well-meaning efforts of the old grannies on the councils of other areas fire us with proud contempt. We hoot with derision at their steep-hill triangles on a simple 1 in 8, we shriek drovers' oaths at the sight of their cattle-crossing signs, we sail airborne over their silly little humped-back bridges. So it was when we set out with a tank full of basic ration to return our heir to school. Convention demands that out of a pile of dubbined rugger boots, squash racquets, tuck, electrical gadgets, and general haberdashery, all duly numbered and name-taped, we should emerge in decent habit to pay our respects to the Housemaster before abandoning the offspring.

We always try to grant the last wishes of the condemned, so that was why we took the coast road. Tide-tables mean even less to our valley than road-signs. We greeted with growing hilarity a succession of boards which told us that the road was impassable at high-water, that duck-shooting was strictly reserved, and that bathing was dangerous. We pressed on in the usual way towards the wheeling seagulls. At the edge of the saltings we ran slap into a sheet of water, but, as it was only a few inches deep, I whistled a cheery hornpipe and surged on round the bend. The bow wave was piling up, and so was my better half's anxiety. The heir, of course, was delighted. Then with a strangled splutter the exhaust sank below the surface and we hove to. A quick glance at the daily paper predicted a 31 feet tide with high-water in another half-hour. By the way the sea was sluicing across the road it was doing its best to comply through the floorboards.

The heir and I ripped off our shoes and socks, rolled up our Sunday-best trousers, and stepped out into an ice-cold January flood. My wife bundled up her fur coat and high heels to sit cross-legged at the wheel while we pushed our mock amphibian towards the distant shore. Some unfeeling engineer had tar-sprayed the road with granite chippings, so sharp that they penetrated even the stocking anæsthesia of the freezing waves. But Fate was kind once we had done our penance. Henry Ford's hardy product shook itself and spat seaweed out of the silencer. We wrung the water out of our pants and arrived in the quadrangle looking more like the end of term than the start. We dumped the body and drove away like mad. Of course the brakes would not work, but apart from that minor distraction we kept a vigilant eye on the road-signs all the way home. The price of Freedom without doubt.

* * *

Into the middle of a dull surgery came Mary, all smiles and looking very well. She sat down and said "A've given o'er wark." Wondering what was coming next I gave a non-committal "Yes," and she continued "and a've brought this for thee," holding out a pound note. Still nonplussed, I asked her why I should have it and she explained that she had just come from the post-office and this was half of her first retirement pension. "Dost thou not remember?" she said.

And then indeed I did. Mary's winter coughs were always accompanied by some degree of asthma, but about twelve years ago she had a particularly resistant wheeze and she became very despondent. She thought that her time had come and that she would never get back to work again. "I shall never live to draw me pension, and think of all them stamps a've bin puttin' on for all these years," she moaned. To cheer her up I suggested that we should make a bargain. If I kept her alive until she could draw her pension we should share it between us—fifty-fifty. I had forgotten, but she had remembered and here was her thank-offering. "It's for thee," she said, "to give to any charity that thou likes."

There are still a lot of nice folk about.

* * *

A very clearly marked feature in many neurotics is an inability to make decisions. This can be elegantly demonstrated by the coal-cellar test.

The patient is ordered to fill a coal-scuttle in a well-lit cellar. He cannot decide which lump is the most suitable to put in the scuttle, and characteristic pawing movements are observed. A viewing window of one-way glass is a convenience. The test is now repeated in total darkness. Since the lumps cannot be seen, there is no hesitation as to which to reach for, and the performance may be greatly speeded up.

The ratio of time-in-the-light to time-in-the-dark is taken, and a value greater than unity indicates neurosis. Resentment will increase filling-time, but since this is likely to be felt more keenly in the dark than in the light, a time-ratio greater than unity will always be significant.

* * *

Outside our front gate a small dog came abruptly into contact with a small car from which an even smaller man sadly emerged. We watched as its last few breaths were quickly spent in the gutter. "Daddy," asked Jo (aged 3) "Did that doggie run across the road and bump into that man's car and get bleeded?" "Yes," said Bill (5), "and now he will go to a hospital and be made all better like Daddy does. Daddy, will you make him all better?" "What a silly doggie," concluded Jo, deep in thought. "Oh, no," explained Bill. "It's not his fault, his Mummy and Daddy should have stopped him, shouldn't they, Daddy?" "Daddy," said the youngest, giving me no chance to get in, "what will they do to that doggie?" At last I had the opportunity of explaining that my hospital didn't take dogs, and, anyway, he was beyond my skill. "Well, what will they do with him?" There was no escape. "I expect they will take him away and bury him." "Oh, but that's unkind," said Bill at once. That was lost on me, and I sought enlightenment. He explained: "Because that will make him even more dead." Quite defeated, I went for help to the kitchen. "But that's a very sensible remark," said my wife, and returned to the washing-up.

The psychological damage from this incident does not seem to be as deep as I had feared. Over the bath later that week I was asked à propos of absolutely nothing: "Daddy, when I'm as old as you are, how old will you be?" Rapid calculations on the wall led me to conclude: "51" (28 minus 5 plus 28 I think). "And when I'm 51, how old will you be?" (Deep thought): "74." "And when I'm 74, how old will you be?" (More deep thought: How Much Longer O Lord?): "97." "And when I'm 97 how old will you be?" Seeing no end to this, and in an admittedly unguarded moment: "I shall probably be dead." No damage, however, this was greeted with uproarious laughter and much jumping about. "And when you're 97 how old shall I be?" he ended up. "You'll probably be dead, too," I said. Enormous amusement at this, both of them quite incapably convulsed with mirth.

What about it, Sigmund?

* * *

In Wales family connection used to be shown by placing the word "ap" (the son of) before a name, and traces of this remain in Parry, Pugh, and Pritchard, sons of Harry, Hugh, and Richard. When this method was discredited, the English "son" took its place, but after the name, and John's son and Hugh's son became Jones and Hughes. But the remote valleys tended to become overpopulated with one family and it became necessary to invent a method of naming the subspecies as it were; so the occupational system was evolved—Mr. Thomas the Post or Hughes the Milk. Sometimes, however, these nicknames have a more topical basis. In our village Owen John Williams is an auctioneer and is known as Owen John the Going Gone, while Thomas Jones, who has only two central incisors left, one up and one down, is Thomas Jones Central 'Eating.

Letters to the Editor

HYPERTENSION: PRESYMPTOMATIC DIAGNOSIS AND TREATMENT

SIR,—Formerly it was held that hypertensive patients become accustomed to their high blood-pressure, which is then necessary to maintain the circulation. Even today many authorities say that hypertension should not be reduced unless it is causing symptoms.[1-3]

But we are in an era when the emphasis is on early diagnosis and early treatment and it is hard to see why hypertension should alone be left untreated until it reaches a stage when nothing much can be done about it. In most cases of hypertension the rise in blood-pressure at first is transitory, labile, and asymptomatic. Why then should we not try to detect it at an early stage and keep the blood-pressure down by comparatively simple measures? Surely we should look on hypertension as a reversible illness, which, like an attack of asthma, should be brought under control as quickly as possible, though we cannot guarantee that it will not recur. We are not unduly nervous about telling a patient that he is suffering from tuberculosis, valvular heart-disease, or diabetes. Why then should we continue to teach that it is best not to tell the hypertensive patient that his blood-pressure is raised? I agree that the actual blood-pressure readings should not be mentioned; but I believe that the patient should certainly be told that he has a mild elevation of blood-pressure, that he should follow certain simple restrictions on his activity and diet, and take some drugs for a time.

On the principle that high blood-pressure, like other disorders, should be treated as soon as it is discovered, I am at present studying a series of eleven cases, of which the following is representative:

In February, 1955, Dr. A, aged 51, complained of headache with a tired feeling at the end of the day. The only abnormality found was a blood-pressure (B.P.) of 168/106 mm. Hg. The B.P. recorded 4 months earlier had been 130/84. Though there were no other symptoms or complications, I decided to treat him with comparatively mild hypotensive agents. He was given reserpine 0·25 mg. twice a day, and 'Theogardenal' (phenobarbitone and theobromine) one tablet twice a day, and advised to reduce his sodium intake by half. The B.P. was recorded on alternate days and in 2 weeks it fell to 140/90. The dose of reserpine was reduced to 0·1 mg. twice a day and stopped after another 2 weeks. The blood-pressure has since remained about 140/90.

The other ten patients have all had a diastolic pressure persisting above 100 mm. Hg for several weeks, and have been treated on the same lines. All have responded, though one showed a recurrence after 4 months and another after 7 months. These episodes of recurrence yielded to similar treatment. In only one case pentolinium tablets had to be used to bring the pressure down initially, the milder hypotensives not having acted.

Of the eleven patients, three were women and eight men, their ages ranging from 42 to 56. They have been under observation for periods varying from 4 to 21 months.

The classification of essential hypertension into benign and malignant is completely misleading. It should be given up. The term "benign" can properly be applied to a condition which has hardly ever been known to cause death, but hardly to essential hypertension in which about 90% of the patients die sooner or later of the well-known complications. For too long this totally inappropriate terminology has led physicians to ignore the presence of hypertension and adopt an attitude of expectancy, with folded hands, until complications set in; by which time it is practically impossible to reverse the changes. With a diastolic pressure fixed at about 130 mm. Hg, the measures required are more complex and more doubtful in their results, and there is the additional danger that thrombotic complications may be precipitated by over-zealous treatment.

The idea that once a mild hypertensive is started on a régime of dietetic control and drug therapy he is likely to require these for many years, is probably incorrect. A large series of cases should be studied the world over to obtain data regarding the late results of early treatment of asymptomatic hypertension. In such studies, workers in India can play as large a part as those in the West. Of the many fallacies surrounding essential hypertension, perhaps the most serious as that there is no hypertension in the rice-eating peoples of the East or that hypertension is a disease of Occidental civilisation. Physicians who have worked in India know that high blood-pressure is exceedingly common in India both in the cities and in the countryside.

Madras Medical College, Madras, India. K. S. SANJIVI.

1. Rosenheim, M. L. *Brit. med. J.* 1954, ii, 1181.
2. Fishberg, A. M. *Med. Clin. N. Amer.* 1956, **40**, 1325.
3. Wilson, C. *In* Price's Text Book of the Practice of Medicine. London, 1956; p. 911.

THE PLIGHT OF HOSPITAL PHARMACY

SIR,—As chairman of the committee that examined some aspects of hospital pharmacy for the Central Health Services Council a few years ago, I must thank you for your timely survey of its staffing problems (Jan. 19).

You rightly identify inadequate salary scales as a main cause of the shortage of hospital pharmacists, and there is no doubt that there will be no significant increase in recruits until salaries improve. But in pharmacy, as in other sections of the health service, that is by no means the whole story. In some respects the problem is akin to that faced by general practitioners. They are asking for higher remuneration, but over and above that they look for better conditions of practice. Dissatisfaction does not show itself so obviously among general practitioners because for them the alternative to grinning and bearing it is a major operation such as emigration to Canada. For pharmacists there is the simpler alternative of moving into one of the other branches of pharmacy, and that is what they are doing. Like the general practitioner, the hospital pharmacist looks for a professional career that is progressive and satisfying as much as financially rewarding, and too many hospitals fail to provide it.

A campaign to increase recruitment cannot succeed if it is linked only with better salaries. It will be necessary for management committees to consider in consultation with their chief pharmacist how far the inadequacies of their pharmacy departments may be responsible for shortage of staff. Many of them need substantial replanning. A large number of them were never properly designed when the hospital was first built and have been left for years to grow haphazardly. Moreover, it should go without saying—but often does not—that the chief pharmacist has the authority and responsibility which must be accorded to the head of a department if he is to do full justice to his work. He must have the effective voice in the purchase of his materials and engagement of his staff. He should be able to report direct to the management committee and to attend its meeting when pharmaceutical affairs are discussed. One of his chief duties should be to tender advice to the medical staff about prescribing efficiently and economically, and he should have access to the medical committee for that purpose.

The salary scale for pharmacists should depend more upon the complication of the work in their department than on the size of the hospital. It should bring a pharmacist up to a good competence at forty or so, and beyond that there should be a sufficient number of well-paid senior posts throughout the service to attract

good men to a hospital career. As you emphasise, special rewards for higher qualifications are likewise important for this purpose. More pharmacists can be recruited into hospitals only when it is generally understood by those in authority that the present staff shortages are due to a general neglect of the hospital pharmaceutical service, which is slowly running down because no-one is tackling the fundamental defects. The service can be rebuilt, but only if it is given a new deal and a new look in all its aspects.

House of Commons,
London, S.W.1. HUGH LINSTEAD.

PRESCRIPTIONS FOR DIABETICS

SIR,—The medical subcommittee of the British Diabetic Association has now clarified with the Ministry of Health some financial alleviations for diabetic patients on the new prescription regulations.

To be brief, a Ministry letter of Nov. 27, 1956, states that the supplies of needles, spirit, testing tablets, and —most important—insulin can be prescribed for three months or more depending on the doctor's view in the individual case. One shilling only per item would be payable, irrespective of the quantity ordered.

British Diabetic Association,
152, Harley Street,
London W.1. R. D. LAWRENCE
Chairman, medical subcommittee.

HYPOPITUITARISM AND GONADAL DYSGENESIS

SIR,—I feel sure that many of your readers who, like myself, are not experts in the pathology and biochemistry of the hormone-deficiency diseases, would welcome some reassurance about the paper by Dr. Jackson and Dr. Hoffenberg in your issue of Dec. 15.

This describes the case of an old man who was admitted to hospital for treatment of hepatomegaly and piles. The authors state that he was suffering from dwarfism, mental deficiency, epilepsy, severe anæmia, and considerable œdema of the legs and sacrum. They explain how cretinism was suspected and go on to describe an insulin-tolerance test which resulted in hypoglycæmic coma and death.

One must presume that the insulin-tolerance test was used in preference to the exhibition of thyroid because of some advantage such as greater safety or greater certainty of the result, which might be reflected in greater certainty of treatment, and hence, greater advantage to the patient. Unfortunately this point is not made clear in the article.

One would also be interested to know whether the patient was held to have died accidentally, as the result of an accidentally produced hypoglycæmic coma, or whether the death was held to be due to a pre-existing condition.

I ask these questions because the authors themselves make it clear that the patient was incapable of coöperation (and therefore incapable of giving consent to an experiment), because the photograph (fig. 1 in the paper) seems to indicate considerable distress on the part of the patient (however, the photograph may well be misleading) and because the article makes no reference to the efforts which must have been made to alleviate the patient's condition.

In cases of this kind, where the scientific interest is great and the end-result to the patient of little scientific importance, it is only too easy to give the false impression that the scientific interest is the only one involved, I feel sure that the authors would welcome an opportunity to correct this impression in this case.

London, N.1. R. E. W. FISHER.

*** We have shown this letter to the authors of the article. Their reply follows.—ED. L.

SIR,—We should like to assure your correspondent that the humane aspects of this case were not overlooked, but that only the basic scientific facts were given in the published report. Actually at the time of investigation of this case (1952) we were quite unaware of its great scientific interest, which became apparent to us later while studying problems of sexual differentiation. We stress that the investigation referred to was *not* purely academic, but was pertinent to the handling of the case.

Shortly before seeing this patient we had investigated two cases of adult cretinism, and we felt fairly sure that we were dealing with another one. An insulin-tolerance test was considered valuable to rule out the possibility of hypopituitarism which we (mistakenly) felt was very unlikely. At the time it was considered dangerous to exhibit thyroid alone in hypopituitary cases, so that this investigation was undertaken as a routine. One of us was present during the insulin test and administered intravenous glucose as soon as possible after the coma, which rapidly restored the blood-sugar but the patient remained unconscious and was found to be hypothermic. He died two days later, having never fully recovered consciousness, despite our best attempts at resuscitation. Hypopituitary patients are well known to be subject to such a mode of death. He did not die in hypoglycæmic coma, although we readily admit and deplore the fact that this episode appeared to have started the train of events which led to his death, which, however, could not have long been delayed in any case.

Regarding the photograph, the patient was weak and unable to stand without assistance. His appearance of distress is easily explained by his efforts, which were required for only as long as it took to work the camera shutter.

We openly acknowledged our error of judgment in this case, but we really hope that we have vindicated our ethical integrity.

W. P. U. JACKSON
R. HOFFENBERG.

DANGEROUS CONTAMINANTS IN STORED BLOOD

SIR,—I am greatly relieved that Dr. Drummond (Jan. 12) thinks that experts can sample blood bottles with a very low contamination-rate. I wish he could persuade the authors of *Notes on Transfusion*, issued by the Ministry of Health, that this is true; for that booklet makes it mandatory to mark as "Dangerous for Patients" every blood bottle 24 hours after it has been sampled. Some regional transfusion directors refuse to accept this directive, and insist that blood must be used even when more than 24 hours have elapsed after the bottle has been entered.[1] I am glad that Dr. Drummond thinks (as indeed I do) that this practice is safe; but it is to my mind scandalous that any regional transfusion director should enforce the use of a bottle of blood which, according to the Ministry's advisers, is dangerous for patients—the more so since, if the patient died, the pathologist would have the greatest difficulty in justifying the action forced on him by the regional transfusion officer.

There seems to be no general agreement on how deaths associated with transfusion should be classified. I submit that one should discriminate between deaths due solely to transfusion and those associated with disease treated by transfusion. For example, during a transfusion given very rapidly because of torrential hæmorrhage the citrate anticoagulant might lower the ionised calcium level enough to cause heart-failure; the ensuing death should not be ascribed to the transfusion. I think this difference will explain the difference between the frequency of transfusion deaths accepted by Dr. Aidin and myself. Deaths due solely to transfusion can be classified into: (*a*) hæmolytic reactions due to serological incompatibility, stale blood, or blood damaged by heating or freezing; (*b*) bacterial contamination; (*c*) cause unknown.

Bacterial contamination itself is often of no importance, for the entry of a few bacteria at the time of administration is harmless, as is shown by the excellent results obtained by the open method. The problem is different with stored blood, for, though pathogens hardly grow at

1. *Lancet*, 1955, i, 205.

+4°C, some saprophytes do so with generation times of the same order as that found by Dr. McEntegart (Nov. 3)—and also with the lag period he found. Such bacteria cannot kill by colonising the patient, but may do so by causing a reaction to their own body proteins or to their metabolites; and they may kill in this way even if they themselves have first been killed, so that Dr. Marsh's (Jan. 12) criteria for deciding whether death was due to bacterial contamination are not valid. It does follow, however, that blood contaminated with a few saprophytes is dangerous only after the bacteria have had a chance to multiply, and Dr. McEntegart thinks that this period of relative harmlessness may be as long as 14 days. If this be so, I cannot see any rationale for doing stained films on all blood bottles which are to be issued.

In this hospital, if the patient becomes ill after transfusion, the transfused blood is cultured at 20°C and at 37°C—and so far out of some 25,000 bottles no reactions attributable to bacteria have been encountered. Can Dr. Aidin (Dec. 22) or Dr. Stark Murray (Jan. 19) tell us how many patients have been saved from contaminated blood by their stained film procedure? Or, for that matter, can anybody else who has been working in England during the last ten years? *Experientia docebit.*

Central Middlesex Hospital, London, N.W.10. GEORGE DISCOMBE.

A MISSED FRACTURE

SIR,—I read with considerable misgiving the report under this heading (Jan. 19).

Firstly, the coroner has no power to criticise anyone: his job is to determine the cause of death and nothing more. Such criticism should be disputed on the spot, for it may well be quoted in subsequent claims for damages.

In this particular case, one should not be too sure that the casualty officer failed in his duty. He was sent an old lady with an injury to her arm; he dealt with this and returned her to the care of her own doctor. It is admittedly to be regretted that he did not diagnose the fractured femur, but neither did he find a fractured skull, diabetes mellitus, and a host of other possibilities. If a casualty officer, or any doctor, thoroughly examined and investigated every patient he saw, he would never leave his surgery or consulting-room.

The final sentence is even more ominous. The public has a right to be treated—and nothing more. It has no right to expect "completeness," and in particular no right to be cured—as many seem to think.

Newcastle General Hospital. J. F. STONE
Senior casualty officer (surgical).

HYPOTHERMIA

SIR,—I wonder whether the initiators of artificial hibernation know about their predecessor who practised this therapy (though in a primitive form) during the 1914–18 war. The information comes from one no less than Mahatma Gandhi,[1] who was suffering at that time from severe dysentery:

"Whilst I lay thus, ever expectant of death, Dr. Tadwalker came one day with a strange person of Maharashtra. He is not known to fame, but the moment I saw him I found that he was a crank like myself. He had come to try his treatment on me. He had almost finished his course of studies in the Great Medical College at Bombay without taking the degree. Later I came to know that he was a member of the Brahmo Samaj. Sjt. Kelkar, for that is his name, is a man of an independent and obstinate temperament. He swears by the ice treatment, which he wanted to try on me. We gave him the name of 'Ice Doctor.' He is quite confident that he has discovered certain things which have escaped qualified doctors. It is a pity both for him and me that he has not been able to infect me with his faith in his system. I believe in his system up to a certain point, but I am afraid he has been hasty in arriving at certain conclusions. But whatever may be the merits of his discoveries, I allowed him to experiment on my body. I did not mind his external treatment. It consisted in the application of ice all over the body. Though I am unable to endorse the effect that he claims his treatment had on me, it certainly infused in me a new hope, and the mind naturally reacted on the body. I began to have an appetite and to take a gentle walk for five or ten minutes."

The event took place whilst "the deadly war in Europe was still going on."

1. Mahatma Gandhi: His Own Story. Edited by C. F. Andrews. London, 1930; p. 292.

St. John's Hospital, Budapest. GEORGE LENART.

A NEW CLINICAL ENTITY?

SIR,—The epidemic of aseptic meningitis which has been observed in different parts of England,[1–4] and which seems to involve pronounced pleocytosis in the cerebrospinal fluid (C.S.F.)[5] has also been prevalent in different countries on the Continent.

Between June and November last year innumerable cases of aseptic meningitis, sometimes with exanthem, were reported in Belgium. The manifestations were roughly the same as those so described by your correspondents:

1. Definite meningeal symptoms, with or without the now well-known rubella-like exanthem, fever, headache, back and neck stiffness, severe muscle pains, vomiting, photophobia, sometimes conjunctivitis, and, characteristically, a very pronounced pleocytosis with cell-counts ranging from 50 to more than 3000 cells per c.mm. Recovery was the rule, but there was a notable tendency to relapse.

2. A kind of "summer-influenza fever," sometimes accompanied by rash, in which no meningeal symptoms were clinically obvious, though lumbar puncture sometimes revealed C.S.F. involvement.

As was pointed out in this journal,[6] there was no "striking evidence of involvement of the substance of the brain and cord"; but mixed infections with poliomyelitis virus were recorded in Belgium, and proved by laboratory findings.

This disease seemed to be very easily transmissible, and we know of many multiple family or secondary cases, as described by Dr. Pickles[2] and Dr. Lyle.[3] Between July and November we isolated 156 virus strains—122 from stools, 28 from C.S.F., and 6 from throat. These viruses were cytopathogenic for monkey-kidney cells but not for HeLa cells. That all these viruses were of the same strain can be presumed from the results of cross-neutralisation tests: any virus isolated was neutralised by any patient's convalescent serum, as well as by rabbit serum after immunisation with one strain chosen as reference.

The identity of these similar strains was evidenced by the following tests: no neutralisation occurred, either by monkey anti-poliomyelitis sera, or by those standard rabbit anti-E.C.H.O. virus sera (received from Dr. A. Sabin) which corresponded to types 7, 8, 10, 11, or by rabbit anti-E.C.H.O. virus sera, ranging from type 1 to type 14 (9 excepted). However, indubitable neutralisation was always observed with anti-E.C.H.O.-9 serum.

Inversely, among standard E.C.H.O. viruses received from Dr. A. Svedmyr and Dr. J. L. Melnick, ranging from type 1 to 14, type 9 only was neutralised by patients' sera, and by rabbit antisera corresponding to Belgian strains.

79 of the patients showed the same rise of neutralising antibodies, between acute and convalescent sera, towards Belgian virus strains and towards E.C.H.O. virus 9.

1. Tyrrell, D. A. J., Snell, B. *Lancet*, 1956, ii, 1028.
2. Pickles, W. N. *Ibid*, p. 1047.
3. Lyle, W. H. *Ibid*, p. 1042.
4. *Ibid*, p. 947.
5. *Ibid*, 1956, i, 789.
6. *Ibid*, 1956, ii, 1091.

Neutralisation results seemed to be confirmed by complement-fixation tests.

The same outbreak of aseptic meningitis was also observed in the Netherlands [7 8] and in Switzerland [9]; from a Swiss stool specimen we have isolated an E.C.H.O.-9 virus, and one strain received from the Netherlands [7] proved to be also of type 9.

Dr. F. Dekking, of Amsterdam,[8] has also typed several strains as E.C.H.O. 9 and has found them to cause myositis in suckling mice. At the beginning of this epidemic we inoculated suckling mice with different stool specimens, without ever provoking clinical symptoms. Possibly pathogenicity for suckling mice is enhanced by several passages on tissue-cultures; so we are now going to proceed to new inoculations of suckling mice with tissue-culture-passaged strains as inoculum. Anyway, the Belgian reference strain was not neutralised by Dr. G. Dalldorf's standard anti-Coxsackie sera, corresponding to the types A1–17 and A19 and to types B1–5.

Whatever antigenic or clinical correlation may be found later on between Coxsackie and E.C.H.O. groups, we feel justified meanwhile, in suggesting that the ætiological agent of the Belgian outbreak of aseptic meningitis was a single strain of virus, antigenically identical with the American E.C.H.O.-9 standard virus strain.

Considering the epidemiological and clinical similarities, one may be tempted to wonder whether the same agent was not responsible for both the British and the Continental outbreaks of aseptic meningitis.

Such aseptic meningitis caused by E.C.H.O. viruses have already been described by several workers.[10–14] Mainly prevalent in the U.S.A. are types 4 and 6.[13 15 16] Other types of E.C.H.O. viruses have been found associated with some rather isolated cases of aseptic meningitis.[13 14 17] Moreover, Neva and Enders [12] isolated in 1954 an agent, afterwards identified as E.C.H.O. 6,[13] during an outbreak of exanthem without meningitis in Boston.

University of Ghent. EMILE NIHOUL.
Institut Pasteur, Brussels. LISE QUERSIN-THIRY.

SIR,—With reference to the series of articles and letters that has appeared—under various names—since last May, it may be of interest to record that we described a similar outbreak that occurred in two villages of the Meon Valley in 1948.[19]

There was a total of 29 cases, 8 of whom were admitted to hospital between Sept. 23 and Oct. 27. The outstanding symptoms were moderate pyrexia, severe frontal headache, vomiting, and pain and stiffness in the back of the neck.

A positive Kernig's sign was a fairly constant feature. The pyrexia subsided with the disappearance of symptoms in a few days. Of the patients treated in hospital, 4 exhibited a transient rash, 5 complained of photophobia and 2 had severe insomnia.

The cerebrospinal fluid showed an increased cell count in all cases investigated; but there was no paresis at any stage. Virus investigation yielded negative results.

S. CHALMERS PARRY
Winchester. ROBERT A. GOOD.

7. Verlinde, J. D. Personal communication.
8. Dekking, F. Personal communication.
9. Rebmann, E. Personal communication.
10. Melnick, J. L. *Amer. J. publ. Hlth*, 1954, **44**, 571.
11. Melnick, J. L. *Ann. N.Y. Acad. Sci.* 1955, **61**, 754.
12. Neva, F. A., Enders, J. F. *J. Immunol.* 1954, **72**, 307.
13. Honig, E. J., Melnick, J. L., Isacson, P., Parr, R., Myers, I. L., Walton, M. *J. exp. Med.* 1956, **103**, 247.
14. Davis, D. C., Melnick, J. L. *Proc. Soc. exp. Biol.*, N.Y. 1956, **92**, 839.
15. Kibrick. Cited by G. H. Werner. *Pr. méd.* 1956, **64**, 1859.
16. Sabin, A. B. Personal communication.
17. Committee on E.C.H.O. viruses. *Science*, 1955, **122**, 1187.
18. Werner, G. H. *Pr. méd.* 1956, **64**, 1859.
19. A Small Epidemic with Meningeal Symptoms Simulating Leptospiral Infection. *Publ. Hlth, Lond.* 1949, **62**, 163.

PLEURAL BIOPSY

SIR,—Closed pleural biopsy, to which you refer (Jan. 19), is likely to prove a safe and useful diagnostic procedure. Through the kindness of Mr. Abrams and Mr. J. W. Jackson, of Harefield Hospital, I have used a needle which allows of aspiration of fluid and biopsy of the parietal pleura in one operation. I hope to report a number of such biopsies later. The following case is an example.

A young airman was admitted with erythema nodosum and a pleural effusion. The composition of the fluid was compatible with underlying tuberculosis; no organisms were found microscopically. Biopsy of the parietal pleura showed granulation tissue, highly suggestive of tuberculosis. A diagnosis was thus established within a few days.

I am grateful to Dr. Drew Thomson and Dr. A. C. Pollard, of the Middlesex Hospital, for the histological report.

Royal Air Force Hospital,
Wroughton, Swindon,
Wiltshire. P. MESTITZ.

PSYCHOTHERAPY IN GENERAL PRACTICE

SIR,—Dr. Neville Davis's letter of Jan. 19 was read with particular interest by the group of four general practitioners at Darbishire House Health Centre where for the past eighteen months Miss Madge Dongray, a trained social worker, has been giving full-time assistance with some of the medicosocial problems arising in day-to-day practice. Since for all of us this was a new experiment in collaboration, it may be useful to describe how we set about it.

It was agreed at the outset to refer to the social worker problems which worried or puzzled the doctors and in which her specialised knowledge and experience [1] might prove helpful. This method differed from that of Dr. Davis and Mr. Heimler in that we did not specially select problems of "mental health" but left each doctor to decide for himself where he felt the need of help.

Many of the problems thus referred were practical difficulties—concerned, for example, with the care of the aged, employment, housing, and finance—in which help could be given to the doctor and the patient in using the social services more effectively. At the end of ten months, however, we found that in just over half the cases discussed between doctor and social worker the most significant factor was directly connected with mental and emotional health. This group of 72 cases was roughly classified as:

1. Psychiatric illness with suspected psychotic features	13
2. Severe neurosis	6
3. Chronic anxiety state	4
4. Less severe anxiety or depression as a more or less persistent factor	5
5. Sudden emotional crises (either at recurrent intervals or in reaction to special circumstances)	14
6. Behaviour problems in children	11
7. Mental deficiency	4
8. Gross marital dysharmony of long standing	5
9. Problem families	10

Many of these cases presented somatic symptoms such as headache, palpitations, and vomiting, although we are not sure whether they could be correctly classified as "psychosomatic."

Dr. Davis's experiment in three-corner consultation gives food for thought. At our centre, where the patient is introduced to the social worker by the doctor, much thought has been given to the way in which the doctor should propose this consultation to the patient, and also to the content of the social worker's interviews with the patient and of her discussions with the doctors either individually or as a group. We are learning to understand the importance of feeling—both in the patient and in ourselves—and to examine how our own attitudes, expectations, and anxieties influence the extent to which

1. Miss Dongray formerly worked as a hospital almoner and in 1952 completed a year of study and practical work under supervision in the child-guidance department of the Tavistock Clinic, London.

we can help the patient. One of us at least admits to a considerable increase in tolerance since the experiment began.

Although at present the "listening" function may be left too often with the social worker, the fact that the doctor has to decide when and how to refer tends to increase his awareness of the emotional content of his interviews as well as of the significance of the patient's social background: the fact that, in many cases which were previously baffling, real help can be given makes careful and generous listening worth while.

Like Dr. Davis, we have found that many patients are substantially relieved by one interview, while some need more and a few have been taken on by the social worker for long-term assistance. Others need referral to a psychiatrist or to the child-guidance clinic or other special sources of help, but there is evidence that the nature of the initial interviews plays an important part in determining whether he can make good use of this specialist aid. The wisdom of interviewing relatives and generally understanding family tensions which affect the patient's health has also been evident.

Unlike Dr. Davis and Mr. Heimler, we have attempted work in which children are involved, because we feel this is extremely important for prevention and because it is the particular interest of the social worker. Interviews with parents of children often result in an easing of tension, with benefit to the child. We have a further line of defence in the psychiatrists attached to the family-welfare service and the child-guidance clinic, who give generously of their time in discussing cases where it is not strictly necessary to refer the patient for psychiatric consultation or child guidance but where the doctor and social worker need advice and support.

Medical students spending a fortnight of their final year with the practitioners are also taking part in case-conferences with the doctor and social worker, at which our method of working is demonstrated and debated.

We, too, feel that "the journey is just begun."

HENRY W. ASHWORTH
HUGH DAVIE
H. GOLDIE
J. LENTEN
Darbishire House Health Centre, Manchester. MADGE DONGRAY.

SIR,—Your leading article of Dec. 29 and the subsequent correspondence have far greater implications than might at first be evident.

Dr. Davis has described how, working with relatively simple techniques, we helped some 70% of the patients in our series to make a partial or apparently satisfactory adjustment to their environment. In 1955 I reported [1] on 41 people, seen at the request of the National Assistance Board, who had been drawing National Assistance for at least two years, and of whom 20 returned to work. The method used, in essence the same as that practised in conjunction with Dr. Davis, rehabilitated many patients who otherwise might still be "on the dole." Likewise from the economic standpoint it may be worth mentioning Dr. Davis's impression that the amount of drugs prescribed for the patients we studied was considerably less than that prescribed for similar patients who were not included in the experiment.

From every point of view it seems desirable that all who deal with the emotionally disturbed—including not only doctors but officers of the National Assistance Board and Ministry of Labour officials—should appreciate the importance of recognising persons who may derive benefit from this type of work. As such recognition would produce a demand for help for far greater numbers than at present, I personally believe that everybody dealing with people in this category should have some guidance in interpersonal relationships, and especially in recognition and appreciation of their own emotional responses, as Dr. Davis has brought out in his letter. This may be utopian, but a beginning must be made somewhere.

London, N.12. EUGENE HEIMLER.

1. Heimler, E. *Med. Offr*, 1955, **94**, 351.

TREATMENT OF SORE THROAT

SIR,—In the three letters from general practitioners last week, I was glad to find general agreement on the general practitioner's authority to speak on sore throat. But two of your correspondents attribute to me opinions which were not voiced in my letter of Jan. 19.

I did not state that all cases of sore throat should be treated with penicillin. On the contrary I went to some lengths to distinguish tonsillitis from pharyngitis, and advocated the universal use of penicillin therapy only for tonsillitis. The common cold is often accompanied by sore throat, which may be the presenting symptom; but this is quite different from the acute inflammation accompanying tonsillar infection, which is also distinguished by cervical adenitis and pyrexia. Tonsillitis is often unilateral—an indication of its separate entity and distinguishing it from the general inflammation accompanying catarrhal infections. Hence my plea for discrimination, on clinical grounds alone, when deciding whether or not to use antibacterial drugs in this condition.

I think that the paper by Chapple et al.[1] effectively answers Dr. Fry's plea for a demonstration that oral penicillin shortens the course of acute sore throats. This paper is an excellent example of the usefulness of such practical investigations in general practice.

It is hardly surprising that I have not met a nasty stomatitis caused by penicillin lozenges, since I never employ this utterly useless form of medication. When referring to oral penicillin therapy in my letter I was careful to qualify this with the word "swallowed." I fear that this must have escaped Flying-Officer Smith's notice, since there was no reference to penicillin lozenges in my letter. I am surprised that he should resurrect the old bogy of induced penicillin resistance. The hæmolytic streptococcus is remarkably immune to this phenomenon, and, even after ten years' widespread use of penicillin, iatrically induced drug resistance is virtually confined to our hospital wards. If this was due to inadequate dosage, our hospital staffs would have much to answer for!

Twickenham. DAVID WHEATLEY.

SERUM-LIPIDS AND ATHEROSCLEROSIS

SIR,—The ætiological and therapeutic problems of atherosclerosis are so admirably dealt with in two articles in your issue of Jan. 19, that it seems almost improper to criticise them. It is, however, a sad comment on our times that the "references" are so numerous but, nevertheless, so defective. By this I mean that only papers in the English and American languages are mentioned, though much valuable work has been published in Europe, particularly in Germany. It is surprising that neither the name Schettler [2] nor the work of Küchmeister et al.[3] receives mention. Both these groups have reviewed the subject in much detail, and have called attention to the value of certain lecithins (from soybean) and 2-4-5 polyoxyethylene sorbitol mono-oleate in causing atherogenic serum to become normal. Of course, it is not certain that such a state of affairs implies that the atherosclerotic process is being prevented or improved, but there is no doubt that the preparation mentioned exerts the type of action claimed by these authors. It appears that the constituents exert

1. Chapple, P. A. L., Franklin, L. M., Paulett, J. D., Tuckman, E., Woodall, J. T., Tomlinson, A. J. H., McDonald, J. C. *Brit. med. J.* 1956, i, 705.
2. Schettler, G. *Ergebn. inn. Med.* 1955, **6**, 278.
3. Küchmeister, H., Goldeck, H., Hammers, H. *Med. Klinik*, 1956, **51**, 35.

an indirect effect on the cholesterol/phospholipid ratio, causing it to approach the normal 1·0: certainly the serum changes that follow administration of the preparation cannot be due simply to the small amounts of lecithins, &c.

It is to be hoped that this line of approach will be pursued.

London, W.1. A. PINEY.

SARCOIDOSIS

SIR,—We are glad to have Dr. Consden's criticism (Jan. 12) of our paper on bacterial residues in sarcoidosis[1] and would like to make further observations on the points he raised.

We have stained by the Ziehl-Neelsen method extracts of normal human skin, subcutaneous tissue, brain, liver, lung, kidney, heart, and skeletal muscle, and subcutaneous rheumatoid nodules, as well as several chemicals such as oleic and stearic acids and cholesterol. When decolorised with acid alcohol (10% HCl in alcohol) none of these was acid-fast. In this we do not agree with Dr. Consden. We find that when decolorisation is completed in two stages in a carefully controlled manner, as suggested by Philpot and Wells,[2] and as mentioned in our original paper,[1] using 25% sulphuric acid followed by alcohol, these substances are not acid-fast. We would suggest that each stage of decolorisation should be for at least half an hour.

On the other hand, the extracts of the four cases of sarcoid were each strongly acid and alcohol fast and resisted decolorisation with 25% H_2SO_4 followed by alcohol for a period of 24 hours in each stage.

Dr. Consden states that, if mycolic acid were present, it would certainly form only a very small proportion of the total fatty acids. We do not know the source of this information as we are not aware of published work besides ours which deals with the fatty acids found in sarcoid lesions. It should be borne in mind that the fatty-acid content of sarcoid lesions may bear no resemblance to that of normal tissue or to that of tubercle bacilli and that we dealt with tissue that in no way histologically resembled normal.

The more important findings were that the extract from each case of sarcoid was shown to be, on infra-red spectrophotometry, a long-chain fatty acid. Each spectrum closely resembled the published spectra of mycolic acid.[3,4] Randall et al.[5] claimed that each fraction of the extracts of tubercle bacilli is identifiable by spectrophotometry. In our original article[1] the spectra had only one absorption band in the region 1180–1320 cm.$^{-1}$ In fatty acids containing up to 21 carbon atoms, there are many bands forming a progression in this region.[6] This evidence rules out the possibility of fatty acids of up to 21 carbon atoms.

Each sarcoid extract isolated had a melting-point in the range 54–58°C (the melting point of mycolic acid is 54–59°C [7–8]) and was a white powder.

In two of the lesions studied (lung and cervical gland) we had sufficient material to extract these tissues after pulverisation, according to the classical methods of Anderson and other workers.[4,9–11] Using these methods, most if not all other closely related substances associated with mycolic acid, such as palmitic, oleic, stearic, and phthioic acids, are removed during the fractional separation. We were left in each case with a white powder, whose melting-point and spectrum were similar to those of mycolic acid.

Taking all these facts into consideration it would seem to us justifiable to regard this organic substance as mycolic acid, as it is a white powder at room-temperature, has a melting-point between 54 and 58°C, is isolated by classical methods from tissues by a method that separates closely associated substances from it, is strongly acid-fast, and above all has the spectrum of a long-chain fatty acid that is extremely similar to mycolic acid.

We would emphasise again that these positive results have been obtained on only the four examples of "sarcoid" that we have examined, and we are anxious to obtain more material for investigation.

W. G. STRAWBRIDGE
Cardiff. S. E. NETHERCOTT.

SIR,—The studies by Mr. Nethercott and Dr. Strawbridge on the chemical composition of sarcoid nodules are interesting and suggestive, but the authors presume a degree of specificity for their findings which may not be justified.

Contrary to their statement, a lipid of the mycolic-acid type with the same infra-red spectrum has been described as a normal component of the human body.[1] It seemed then, as it does now, that tuberculoid reactions and the chemical extractions for mycolic acid have the same level of only partial specificity. Where there is a tuberculoid granuloma, there should be a compound resembling mycolic acid, but if such a compound can come from such diverse cells as spermatozoa and mycobacteria, it conceivably can have yet a third source in sarcoidosis.

Department of Pathology,
Memorial Center,
New York. JOHN W. BERG.

RECURRENT MOTOR PARALYSIS

SIR,—The interesting case described by Dr. Breen and Dr. Emond in your last issue suggests a possible diagnosis of myasthenia gravis. Admittedly, the disorder is rarely seen before the age of 10 years, but I have met with cases between 4 and 7 years, and examples are described, for example, by F. R. Ford at 5 and 6 years and even younger.[2] The manifestations of myasthenia in children are often atypical, but facial paralysis is not infrequent and involvement of the diaphragm is known to occur. If and when the symptoms reappear, a neostigmine test should confirm or disprove myasthenia gravis.

London, W.1. C. WORSTER-DROUGHT.

DILUTION OF INULIN

SIR,—When, some time ago, I became interested in the study of renal function, I turned in vain to the available literature to determine the correct diluent and dilution for 10% inulin to render it isotonic for intravenous or subcutaneous administration.

As supplied by Messrs. Kerfoot, pyrogen-free 10% inulin is a supersaturated solution in distilled water that requires dilution for constant infusion if the solution is to remain stable without recrystallisation during the course of an experiment.

Using serial dilutions of the 10% inulin solution in distilled water, and heparinised washed human red cells as an "osmometer," I found that the undiluted 10% inulin solution was isotonic with human red corpuscles; there was an increase in the packed-cell volume of the red cells with a dilution of 7·5%, and hæmolysis became visible when dilutions of 5% or higher were used.

This indicates that the 10% solution of inulin as supplied may be used undiluted shortly after dissolution by heating for priming doses, but should be diluted with 0·9% sodium-chloride solution for sustaining infusions. I have found it convenient to calculate the amount of 10% inulin necessary per minute to sustain a plasma level of 40 mg. per 100 ml., and to make up this to 1 ml. per minute with isotonic saline solution.

I hope that these results will be of value to any tyro confronted with the same problem as was I.

Department of Medicine,
University of Cape Town. E. DOWDLE.

1. Nethercott, S. E., Strawbridge, W. G. *Lancet*, 1956, ii, 1132.
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MÉNIÈRE'S DISEASE

SIR,—In connection with your leading article last week I would like to emphasise the enormous help that has been derived as to the nature and causes of attacks of Ménière's vertigo by the careful post-mortem study of the findings in fatal cases of acute apoplectiform vertigo in patients with myelocytic leukæmia. This was obvious from my article with Mr. Rickard Lake entitled Acute Ménière's Symptoms in Splenomedullary Leucocythæmia in *Medico-Chirurgical Transactions* (1900, **83**, 185). In this we were greatly helped by Dr. Louis Waldstein, then resident in London though not practising. The most striking cases from the literature of the subject were referred to, and our communication was followed on the same evening by one on an analogous case by F. W. Mott (later Sir Frederick Mott).

London, N.W.1. F. PARKES WEBER.

SHORTAGE OF RADIOGRAPHERS

SIR,—Dr. Illingworth (Jan. 5) has given his views on the causes of the shortage of radiographers. As some of his statements are inaccurate and misleading, I should like to reply.

Firstly, the dissatisfaction felt by radiographers towards their "inadequate remuneration" is by no means confined to "a few male radiographers." There is overwhelming evidence at the society's headquarters that this dissatisfaction is universal throughout the profession. At a meeting held recently in London to discuss the disastrous salary award made in November, the number of women attending greatly outnumbered the men and they were by no means silent observers but showed a keen interest by their questions and suggestions.

Secondly, the Society of Radiographers has no regulations governing the age at which a student radiographer may commence training, although no student may qualify before reaching the age of 20—a reasonable age, bearing in mind the responsibility of the radiographer when dealing with sick and injured patients, more especially now that the danger of excessive radiation is so much to the fore.

Thirdly, the Society of Radiographers, along with other professional societies, has been required to submit to the Minister of Health its syllabus of training, educational standard, details of examinations, and the composition of its board of examiners. These have been approved by the Minister. More recently the educational requirements were broadened in order to assist recruitment, and this step was also approved by the Minister.

The Society's board of examiners is composed of radiologists, radiotherapists, physicists, and X-ray technologists, many of whom are not members of the society, together with radiographers. This board is virtually an autonomous body, and it is ludicrous to suggest that the society, makes its examinations too difficult, thus limiting entry into the profession. Dr. Illingworth himself has for some time been one of the society's examiners.

It is universally accepted that those who understand the principles underlying the construction of apparatus use it to the best advantage, and the syllabus in physics and apparatus was drawn up with this in mind. It is the duty of this society to see that radiographers have this basic knowledge, especially when they have to handle complicated and very costly apparatus which is capable of doing irreparable harm to both the patients and themselves.

It is to the advantage of the radiologist and the medical profession generally to have a fully staffed department of highly qualified, competent radiographers able to carry out their duties efficiently, and to pay proper attention to the care and comfort of the patient and thus enable diagnosis to be confirmed or to record progress with the minimum radiation exposure to the patient.

Finally, the post of superintendent radiographer is essential as on this radiographer falls the responsibility of the day-to-day administration of the department. Even in departments where a full-time consultant radiologist is appointed, a great deal of responsibility falls on the superintendent radiographer, and in the majority of hospitals where the consultant is only part-time the superintendent radiographer often has to accept the responsibility of running the department and for the care and welfare of the patients as well as maintaining a high standard of radiography.

The standards of training required by the Society of Radiographers are reputed to be the best in the world and in no small way contribute to the high standard of the radiological services of this country. Nothing should be done to lower this standard or the service to the patients.

Society of Radiographers,
32, Welbeck Street, London, W.1. MARY VAUGHAN
President.

SIR,—I can but suppose that Dr. Illingworth wrote with his tongue in his cheek. Should this not be so, it must be inferred that he would favour the complete disbandment, not only of the Society of Radiographers, but of all auxiliary medical examining bodies. If physics is superfluous to radiography, is it any more necessary for training for the radiological diploma?

A superintendent's duties are varied, and the smooth running of the department and the contentedness of the staff depend possibly more on his handling than on any other factor. He provides the liaison between the radiologist and the remainder of the staff. If Dr. Illingworth feels himself capable of taking over the technical and administrative duties of the superintendent radiographer in addition to those of radiology in a reasonably large department, then I must take off my hat to him.

Almost all superintendent radiographers must, of necessity, be capable of carrying out "running repairs." As a correspondent has already said, we are not all within easy reach of the servicing engineer, nor can we afford to let a major piece of apparatus lie idle. Incidentally, these "running repairs" save managements some hundreds of pounds annually—a fact which most managements are totally unaware of.

General Infirmary,
Salisbury. K. CRUICKSHANK.

RETURN TO PLANNING

SIR,—Arising out of your leading article and correspondence to date on this matter, two big points appear to have arisen; firstly, the plight of the young married registrars or senior hospital medical officers, often with children, whose remuneration is so inadequate; secondly, the whole question of merit awards.

Surely if there is to be a return to planning, there should be an abolition of all merit awards, which must inevitably encumber the supertax-paying consultant. Let these vast sums of money handed over as merit awards (the large portion of which is handed back in tax to the Government) be spread amongst the well-deserving registrars and senior medical officers.

Windsor. D. MAXWELL.

PROLONGED PYREXIA IN CHILDREN

SIR,—In reply to Dr. Wallis, who wrote last week, my reasons for not considering brucellosis as a diagnosis were not the upper respiratory symptoms or the one negative agglutination test, but the occurrence of these cases of pyrexia starting at a time when an epidemic of influenza was present in the town and surrounding countryside. Moreover none of the patients had a rash, palpable spleen, or neutropenia, and the temperature chart did not show an undulant type of fever. The milk is pasteurised non-tuberculin-tested.

In the absence of serological proof, it is possible to suggest that the epidemic in the children's home, although following an identical clinical pattern, was different from that in the surrounding area. If this is so, it is a most remarkable coincidence.

Chipping Norton,
Oxon. F. E. JAMES.

RAISED C.S.F.-SUGAR LEVELS

SIR,—I wonder if any of your correspondents can give me some information about raised levels of sugar in the cerebrospinal fluid (C.S.F.).

We deal with a large number of C.S.F.s, as this is a fever hospital and a poliomyelitis unit. Off and on over the past few years we have come across the odd C.S.F. sugar above the normal limits—usually about 120–140 mg. per 100 ml.—and, as the C.S.F. pressure was raised, it was assumed that this merely reflected the blood-sugar level at the time. Unfortunately no blood-sugar estimations were performed. In every case a repeat C.S.F. after clinical recovery gave a result within normal limits. Recently, however, we had a very high result—180 mg. per 100 ml.—and a blood-sugar taken simultaneously was only 88 mg. per 100 ml. The patient, a case of bulbar poliomyelitis, has not yet sufficiently recovered to make a repeat lumbar puncture worth while.

I know of no reference to such unusual results.

Rush Green Hospital,
Romford, Essex. F. BRAFIELD.

CARDIAC ARREST

SIR,—Some recent papers on cardiac arrest on the operating-table,[1–3] and the letter from Professor Stammers last week setting the modern treatment in its historical perspective, have focused attention on this dire calamity. May I plead for four practical measures which would lessen the mortality of the condition:

1. The surgeons and anæsthetists in each hospital should draft a short plan for action to be taken in case of sudden cardiac arrest, and this should be displayed in the operating-suite and be familiar to all who work there, especially the junior surgeons and anæsthetists.
2. All surgeons, no matter what their specialty, should, together with their junior colleagues, go to the post-mortem room, say, once a year to familiarise themselves with the technique of transthoracic cardiac massage on the cadaver.
3. Each operating-theatre should be equipped with a drum containing the sterile instruments, retractors, syringes, and ampoules needed in the emergency.
4. Each theatre suite should be provided with an electrical defibrillator.

To be fully prepared to meet the emergency is to be more than half-way towards its successful management.

Southend-on-Sea. J. ALFRED LEE.

A NEWSPAPER FOR THE PARTLY SIGHTED?

SIR,—In everyday work in a general practice one is struck by the number of patients who have become "partly sighted" in their late sixties and early seventies. Sudden and permanent deterioration in vision may follow a stroke of one type or another, or slow deterioration may be due to cardiovascular degeneration embracing conditions responsible for retinal failure.

Often the patient is intelligent and mentally active but forced into early retirement by the physical infirmities consequent upon cerebrovascular degeneration. At one moment the patient may be at the head of a large business or in control of a school, and the next he is bedridden, eclipsed and useless. The plight of these people is the worse because their one link with the rest of the world has been severed. They can no longer read.

I have several such patients who struggle with the daily nationals and their favourite journals but can read only the headlines. How many are heard to say: "I can read the headlines, but I cannot make anything of the rest?"

The purpose of my letter is to ask if it is possible to print a weekly newspaper all in headline type for these patients. There are, I calculate, at least 100,000 people in Great Britain whose sight is sufficient to read large headline type but not sufficient to read ordinary letterpress. What a boon it would be to these people to be able to read all the news themselves and feel that once again they are in touch with the outside world.

A large magnifying-glass is not the solution to this problem. The field of vision is reduced too greatly and there is too much peripheral distortion to make reading anything but a labour.

Is there a newspaper printed all in headline type? If not, could any institution be persuaded to try the experiment? What an opportunity for a repressed journalist to publish ten thousand words in headlines and to feel he is doing good at the same time.

Sheffield. E. C. ATKINSON.

A "POST-ACUTE" HOSPITAL

SIR,—According to a newspaper report cited in your news columns last week, Mundesley Sanatorium is to be taken over by the East Anglian Regional Hospital Board as a "post-acute" hospital.

"Acute" means "coming sharply to a crisis, not chronic" (*O.E.D.*). We already have "sub-acute" and "hyper-acute" (or, for the purist, "super-acute"); but "post-acute" seems to be new. I take it that post-subacute and post-chronic patients will not qualify for admission; so let us hope that early ambulation on the Norfolk beaches will meet with good patient-acceptance from the post-acutes.

Institute of Diseases
of the Chest,
London, S.W.3. J. R. BIGNALL.

YOGURT IN GASTRO-ENTERITIS OF INFANCY

SIR,—We have read Dr. Raffle's letter[1] with interest as we have used yogurt for the treatment of gastro-enteritis in a number of patients. We have found that commercial yogurt preparations differ in their efficacy, and possibly this is due to variation in the microflora between the different yogurt preparations.

The normal yogurt today consists of a roughly equal mixture of *Lactobacillus bulgaricus* and *Streptococcus thermophilus*. *L. bulgaricus* is the organism originally publicised by Metchnikoff, but it has been shown by numerous investigators[2–6] that *L. bulgaricus* not only cannot proliferate in the gut but rapidly dies out. For lactobacillus therapy, therefore (as distinct from yogurt as a food), *L. acidophilus*, which can be regarded as a normal inhabitant of the intestine, should be used. Either a pure culture of *L. acidophilus* (acidophilus milk) or a yogurt containing an appreciable proportion (e.g., 10%) of *L. acidophilus* should be used for the treatment of gastro-enteritis and similar complaints.

Although the attitude of practitioners generally towards cultured milks is very mixed, there is considerable experimental evidence that for some complaints (e.g., gastro-enteritis, colitis, constipation, biliary disorders, flatulence, malaise, migraine, nervous fatigue) cultured milks, and especially acidophilus milk, can be extremely valuable.[4–6] Yogurt and acidophilus milk can often be taken by those who cannot take ordinary milk. It thus has value as a food for those unable to digest milk. The curd formed in the stomach by cultured milks is much finer than that formed by milk.[5 7]

Many examples of the value of cultured milks supported by sound experimental evidence are given in the literature. We may quote in this connection the observations of Comly[8] and Mayon-White[9] on deaths of infants from methæmoglobinæmia as the result of bacterial reduction of nitrate in water, and the use of yogurt as a

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2. Rettger, L. P., Cheplin, H. A. Intestinal Flora. London, 1921.
3. Cruickshank, R. *Brit. J. exp. Path.* 1928, **9**, 318.
4. Rettger, L. P., et al. Lactobacillus Acidophilus and its Therapeutic Applications. London, 1935.
5. Davis, J. G. *Food*, 1952, **21**, 249, 284.
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7. Davis, J. G. *Bull. Hosp. St. Cruz, Barcelona* (in the press).
8. Comly, H. H. *J. Amer. med. Ass.* 1947, **129**, 112.
9. Mayon-White, R. M. *Lancet*, 1951, i, 931.

remedy. A particularly interesting paper on cultured milks in relation to stomach conditions in humans of various ages is that by Orla-Jensen et al.[10]

J. G. DAVIS
London, W.1. D. LATTO.

SOCIAL STRESSES SEEN IN GENERAL PRACTICE

SIR,—The family doctor sees certain symptoms and complaints recurring under similar conditions. He can, if he looks for them, recognise particular social conditions which favour particular kinds of illness. The following are three examples, all of them (as it happens) chiefly affecting men 40 to 60 years of age.

Football Matches

People of all social classes have become weekly devotees of the local football game and, fit or not, will attend a match in any weather.

Some patients, though suffering from a feverish cold or acute bronchitis, thus expose themselves against their better knowledge to damp cold weather. They may even be compelled to be absent from work for this reason, or, by following their urge, turn trivial illnesses into more serious ones.

More important are those with coronary disease. The football-grounds are often further from the car-park or bus-stop than they usually have to walk; they hurry and become members of the herd, rushing to their stands, and often have to climb many steep steps, enduring a physical effort they would do their utmost to avoid at any other time. In addition, their emotional excitement leads to further strain. I find that patients who usually need perhaps 2–3 glyceryl trinitrate tablets a day may have to take 8 during each match. I have records of several patients in whom a first or a fatal attack of coronary thrombosis can be directly attributed to attendance at a match.

Lodge Meetings

Looking at the history of middle-aged patients with nervous breakdown, hypertension, or coronary disease, it is surprising how many regularly attend Masonic meetings and break down in preparing themselves for high office in their lodge. At an age when they are out of mental training for such work, they have to learn by heart long passages of ceremonial formulæ and speeches. Sometimes for a year or more, their free time, and often long night hours, are devoted to memorising long passages; and this can lead to continuous anxiety. Ambition, pride, and fear of failure usually keep them going until their object is achieved, and then they break down in utter exhaustion, often with an anxiety state or coronary thrombosis. The ceremony itself, with perhaps two hours in a locked or closed room, causes acute anxiety symptoms.

These lodge activities are rarely disclosed spontaneously by the patient themselves, but once attention has been drawn to them (usually by their wives) the strain is admitted. Such a strain is undoubtedly more significant in breakdowns than has been realised. The family doctor can often prevent these men, when they are seen in time, from doing something which will be detrimental to their health. Perhaps some lodges would allow their members to read their ceremonial addresses and not insist that everything must be spoken from memory.

Income-tax Difficulties

In my third group are those who fear, or are actually in trouble with, the income-tax authorities. Their symptoms of sleeplessness, nervousness, lack of concentration, and feeling run down, are so characteristic that one can almost ask them outright whether they have any income-tax troubles. An interesting point is that these people do not start worrying until they are in fear of being found out or are already in difficulties. The severity of symptoms is not always in proportion to the gravity of the offence. It seems particularly to depend on the length of time taken to settle the problem with the authorities, and, even if the material effect of the settlement is less ruinous than had been feared, the effect on physical and mental health is often devastating. No treatment is likely to do much good until the authorities have reached their decision, and the only help a family doctor can give is friendly advice to disclose everything in order to save the patient's best asset, his health.

I offer these as illustrations of social strains which are obvious when once observed and which perhaps need more attention than they generally receive.

Manchester. R. FRIEDLAENDER.

10. Orla-Jensen, S., et al. *R. Danish Acad. Sci. Lit.* 1945, **111**, 4.

VAGITUS UTERINUS

SIR,—Mr. Russell's article (Jan. 19) reminded me that I encountered this phenomenon about 1926. During a forceps delivery, before the head was visible, the baby "squawked." The midwife, never an encouraging type, muttered in my ear: "you've done it all right, this time, doctor!" However, all ended well.

Middlesbrough. JOHN CAHILL.

THE FUTURE OF NURSING

SIR,—I was relieved to see the letter from Miss M. M. Edwards last week and the views she has expressed on the right relationship between doctor and nurse.

As district nurses we willingly work under the direction of a doctor in carrying out the treatments he orders and reporting to him on his patients. We would not have it otherwise, recognising that the doctor has medical knowledge, skill, and responsibilities far beyond those of a nurse, and that he is her respected colleague.

General practitioners, from whom 90% of the district nurse's patients are referred, have, since the Queen's Institute was first organised nationally 70 years ago, worked in harmonious partnership with district nurses. These nurses feel no need, even when they are district nurse-midwives and health visitors, to proclaim that "they are practitioners in their own right."

When their relationship is unquestioned, from long experience it is found that the doctor readily leaves to the nurse, with or without consultation, full responsibility for the nursing comfort, morale, hygiene, and health teaching of his patients, and for obtaining social help. He knows that the nurse will keep him informed of the patient's progress, and of when his medical help is needed urgently. Both work with one objective, but it is the doctor who shoulders the ultimate and greater responsibility.

The training of a doctor is extensive and requires to be of a high university level for the knowledge and skill he must attain. It is wasteful if he undertakes work, except in expediency, which a nurse could do. The training of a State-registered nurse is less extensive, and it is in my opinion doubtful if it requires to be of a university level even for the few leaders of the nursing profession. It seems that the motives suggesting that there should be more nurses with university degrees are mainly "to keep up with the Joneses" in other countries, many of which have universities of very different standards from those in this country. It seems wasteful that the precious places in the few universities of Great Britain should be taken up by potential nurses.

The well-trained mind, capable of critical analysis, is of undoubted value to any nurse whose work requires her to administer or to teach. If, as is the case with a few district nurses, she happens to have a degree before becoming a nurse, she yet may have no desire to administer or to teach. Even if she does desire it, a specially designed advanced nursing course after registration seems likely to be more helpful than her previous university degree.

It is wasteful also, if State-registered nurses, whose basic education requires to be good and whose training is long and comprehensive, are used for work, except when unavoidable, which a State-enrolled assistant nurse could undertake. A considerable increase in the employ-

ment of assistant nurses working in partnership and with the guidance of State-registered nurses seems to be essential.

The future of the nursing service will be strengthened if the concern of doctors in the training of the State-registered nurse is welcomed and encouraged, and if the latter concern themselves more than at present with the wider training of the assistant nurse.

Let each one choose the career within his or her ability or in which can be found satisfaction, recognising the other's greater knowledge rather than considering lowering the standards of each.

Queen's Institute of District Nursing, London, S.W.1. E. J. MERRY.

SUCCESSFUL ABSENTEES

SIR,—Your readers have noted with interest the innovation at St. Andrews University (reported in your columns last week) whereby the final examinations may be passed in the absence of the candidate. This innovation has no doubt been designed to benefit those who have also taken their medical course in absentia.

Westminster Medical School, London, S.W.1. ANDREW SHERRINGTON.

SYRINGE CARRIER

SIR,—Most people with experience of syringe carriers for dry sterilisation will agree with Dr. McDonald and Mr. Pirnie (Jan. 26) that the syringe carrier suggested by Dr. Lerman (Jan. 12) is unlikely to solve the problems of the anæsthetist. But one cannot allow their dogmatic attack upon multiple syringe carriers to go unchallenged.

In our experience a properly designed multiple syringe container is the only answer to the many problems, organisational, technical and financial, involved in running a syringe service which will cover all hospital departments, small outlying hospitals, the general practitioners, and the laboratory itself. After some years of using the Kingston type of multiple syringe carrier,[1] and issuing it to some hundreds of users, we find it has none of the disadvantages alleged by Dr. McDonald and Mr. Pirnie.

Firstly, it need not "contain a fixed set of syringes which may or may not accord with the demands of varying circumstances." Just because our normal pack contains a variety of syringes—2, 5, 10, and 20 ml.—it answers most demands. But the normal pack can easily be changed to meet special needs. As our anæsthetists do not all have the same views as to what is best we have now had a certain number of boxes made with sides in distinctive colours (red, blue, and green) and by altering the clips can issue packs with all one size—and the theatre carries a stock of each. Other users have other needs and can have a box specially packed to meet them.

Secondly, in our experience with this type of box, which was designed with these points in view, the contents are *not* "rendered potentially non-sterile on first opening." Nor can the needles or syringes be contaminated by "air, droplets, or hands." As for the "life" of one boxful our turnover of 3500 syringes a week ensures that this is not prolonged, but we do not in any case require all the syringes to be used before a box is returned. It is a very simple operation to replace a few used syringes and sterilise the lot.

Thirdly, in the Kingston box the sign of sterility is the continued presence of the cotton-wool plug round the needle. To use the syringe this seal must be removed, and once removed it is quite clear that the syringe has been used (or at any rate taken out and exposed to air even if, for any reason, not used). In practice, after turning these boxes over hundreds of times, after their use by all grades of medical and nursing staff, after use for all hospital purposes, we are quite certain of their sterility and continuing sterility.

The problems of a syringe service which neither multiple nor single pack will absolutely abolish—the needle that looks sharp but is not, the plunger that has stuck, the imperfect fitting of needle to syringes—all remain unless one uses an extravagant number of people on the job. Our multiple pack has reduced these to a minimum because it saves time; and it has reduced costs because breakages are only about one per cent. of all the syringes issued.

Kingston Hospital, Surrey. D. STARK MURRAY.

1. Murray, D. S. *Lancet*, 1954, i, 1274.

Parliament

The Right Kind of Bed

MOST old people lead contented lives with their families or friends but, as Lord AMULREE pointed out in the House of Lords on Jan. 22, many of the small group of old people who live alone fall into the unfortunate administrative gap between the National Health Service Act and the National Assistance Act. 40% of the old people who applied for admission to hospital, he said, belonged to this group, and after their hospital treatment it was difficult to find anywhere for them to go. They were not sick; they were suffering from profound disability, and though local authorities were providing more accommodation for people who were on the borderline between being really fit and in need of hospital accommodation, there was still not enough. As a result, many people were forced to remain in hospital, occupying beds which were urgently needed for the care of the sick, and which cost £12–15 a week each.

Lord Amulree did not for a moment advocate a return to the old poor law, but one principle in it which he thought was valuable was that people in need of care and attention, whether sick or well, were under the same authority. One of the disadvantages of the present division was that old people were often reluctant to go into a welfare home because for them it still had, however mistakenly, a flavour of the workhouse. Another was that the welfare authorities would not accept people who were not fit. In his view, while accommodation was so straitened, it should be used for the people who really needed it. In 1954, 65,000 old people were living in these homes compared with 47,000 in 1945. Were there some people living in these homes unnecessarily? Could some of them, with the help of better domiciliary services, not live on their own, and free the homes for the less fit? Indeed, if the right people were kept in the beds we had, he doubted if any big increase was needed.

We should get away from the terms "acute sick" and "chronic sick." A more useful division, he suggested, was people who were sick and needed medical care and treatment, and people who were disabled and needed different care and attention. He also thought it would help if regional boards and local authorities made joint appointments so that the same doctors looked after old people in hospitals and the local-authority homes, and if the welfare services could be transferred to the health committee of the local authority.

Lord COTTESLOE, in his work as chairman of the North West Metropolitan Regional Hospital Board, had seen something of the difficulties which arose from shortage of accommodation. He agreed that the wrong people were often in what beds there were. To his mind the greatest cause for concern was the substantial number of mental-hospital patients who should never have gone into a mental hospital at all but should have found a place in a welfare home. Once these people had been sent to a mental hospital it was difficult to transplant them to a home. He was anxious that we should be careful that for the future no old people who were merely a little confused should find their way into the mental hospitals.

The EARL OF HOME, the secretary of State for Commonwealth Relations, replying for the Government, offered some support for Lord Amulree's view. In 1955 some 4500 elderly people who no longer needed full hospital treatment occupied hospital beds. On the other hand, there were 2000 old people who would be better in hospital than in the premises in which they were housed. So by transfers, and if additional premises and home-helps were available, some 2500 beds could be used to better purpose for others in more urgent need.

Reviewing what had been done for old people he said that in the past nine years 70 geriatric units had been started, while the number of elderly outpatients had risen from 7000 in 1950 to 27,000 in 1955. Local authorities had opened 900 small residential homes. The home-nursing service made 12½ million visits a year to old people. We could thus, he thought, conscientiously say that we were not neglecting the old. But it would be unrealistic against the background of the national income to expect that there should be a great increase in capital investment. Further help for the elderly must rest on greater efficiency in organisation, greater coördination of the efforts of hospitals, doctors, and welfare authorities, and greater appreciation by the local authorities of the needs of the old. In 1954–56 the Ministry of Health's officers made a survey of the services for the elderly sick throughout England and Wales. The results had been assessed on a national basis and the Minister proposed to issue memoranda with suggestions arising from the survey and to send them to all hospitals and local authorities.

QUESTION TIME

Doctors' Remuneration

Mr. MARCUS LIPTON asked the Minister of Health what negotiations were pending to increase the salaries of doctors. —Mr. DENNIS VOSPER replied: The Secretary of State for Scotland and I have agreed to meet representatives of the profession towards the middle of February. For the present, I have no statement to make.

Mr. JOHN RANKIN asked the Minister if he was now prepared to accept the contractual obligation implied in the Spens report as the basis of all future salary negotiations with the medical profession? Mr. VOSPER: I am advised that no legal contractual obligation exists. Mr. RANKIN: Does the Minister not realise that now he has properly decided to meet the doctors in negotiations over their claim for higher remuneration, it will be necessary for him to face up to what are called the implications, alleged or otherwise, of the Spens reports? Would it not be wise of him to take this matter into consideration in the negotiations? Mr. VOSPER: I have just said in my original reply that no legal contractual obligation exists. That opinion was conveyed to the doctors at an earlier meeting, and when they meet in February they will be well aware of the position. Mr. RANKIN: Is the Minister not aware that this is one of the points which has caused every scalpel in Scotland at least to be drawn during the week-end and that there will be no satisfactory issue unless the matter is dealt with? The doctors do not accept the explanation he has given. Mr. VOSPER: I have already said that I will meet the doctors, and I shall look forward to that meeting; but I shall not be meeting them on the basis that a legal contractual obligation exists.

Cigarette-smoking

Mr. LIPTON asked the Minister whether he would appoint a select committee to consider what immediate and practical steps can be taken to reduce cigarette-smoking.—Mr. VOSPER replied: I do not consider that a select committee would be an appropriate body for this purpose.

Mr. SOMERVILLE HASTINGS: Short of appointing a Royal Commission, does not the Minister feel that the evidence is sufficiently strong for something definite to be done by his department? Ought not young people and children in the schools at any rate to be warned of the dangers of cigarette-smoking? Mr. VOSPER: I do intend to look further into this matter and to take the advice of those concerned. I do not believe at the moment that a select committee would be the right vehicle. The Minister of Education has, of course, recently issued further advice to the schools.

Prices of Pharmaceutical Products

Replying to a question Mr. VOSPER said that the current negotiations with the pharmaceutical industry concerned the prices of proprietary preparations. Discussions had recently been concluded, and in the light of these the industry had revised their proposals, which he was now considering.

Prescription Charges

Mr. S. S. AWBERY asked the Minister if he was aware that many chronic sick, cancer patients, diabetics, those suffering from ulcers, and others with long-standing complaints are not receiving the treatment they need and which was intended by the National Health Act, 1948; that chemists are reporting a reduction of 50% in the prescriptions since the new charges were made on Dec. 1. Mr. VOSPER: I have no evidence from professional organisations or elsewhere that patients are not receiving the treatment they need, or that there has been such a reduction in prescriptions dispensed.

Number of Patients and Hospital Salaries

Mr. C. J. A. DOUGHTY asked the Minister which officials of mental hospitals were responsible for the discharge of patients; on what basis they were remunerated; and whether their remuneration was related in any way to the number of patients in the hospital.—Mr. VOSPER replied: No official is authorised to discharge a patient in a mental hospital, but any two members of the hospital management committee, when ordering the discharge of a temporary or certified patient, must do so with the advice in writing of the medical superintendent. The salary of medical superintendents is generally based on length of service in their clinical grade and not on the number of patients. Mr. DOUGHTY: It therefore follows, does it not, that if beds in a mental hospital are empty, the officials responsible for the discharge of patients suffer no financial loss? Mr. VOSPER: Yes, that is true.

Mr. N. N. DODDS asked the Minister on what basis the salaries of senior nursing officers in mental institutions were fixed.—Mr. VOSPER replied: The salaries of both matrons and chief male nurses in mental and mental-deficiency hospitals are determined by the status of the hospital and the number of staffed beds for which the officer is responsible. The classification of deputy matrons and deputy chief male nurses for salary purposes is governed by that of their chiefs.

Health of Immigrants

Captain H. B. KERBY asked the Minister of Health if he was aware that Great Britain was the only Commonwealth country that any immigrant could enter without producing a certificate of good health; and what steps he proposed taking to safeguard Great Britain from imported communicable diseases. Mr. VOSPER replied: The existing Public Health (Ships) and (Aircraft) Regulations, 1952, give wide powers to port medical officers to deal with any case or suspected case of communicable disease arriving in this country. In addition, alien immigrants may be medically examined under the Aliens Order, 1953.

Obituary

JOHN McGRATH
M.Sc., M.D. N.U.I.

THE death, on Jan. 11, of John McGrath, professor of pathology and bacteriology and dean of the faculty of medicine in University College, Dublin, leaves a gap in Irish medical life.

Born in co. Waterford in 1901 he was educated at Clongowes Wood College, graduating B.SC. at University College, Dublin, in 1921. The following year he proceeded M.SC. and he graduated in medicine in 1925. He spent some years abroad in postgraduate study in Vienna, Heidelberg, and Mannheim before returning to Dublin, where he was appointed assistant pathologist and biochemist at St. Vincent's Hospital with which he was to be associated for the next quarter of a century.

In 1929 he was appointed lecturer in medical jurisprudence in University College and also State pathologist, and in 1933 he was called to the Irish Bar. It was in forensic medicine that he became, perhaps, most widely known, and there can have been few courthouses in the country in which he had not given evidence. He studied every case with scrupulous attention to detail, and the Irish courts were fortunate in having at their disposal a man of such vast experience whose evidence was always so clearly expressed.

He was an exceptionally good lecturer, and for many years he was external examiner to Dublin University and to the Queen's University of Belfast. In 1952 he was appointed to the chair of pathology and bacteriology at University College, Dublin, and last year he was elected dean of the faculty of medicine. Unfortunately, almost immediately afterwards he became seriously ill.

He was a member of the Royal Irish Academy, of the senate of the National University of Ireland, and of the

Medical Registration Council, and he had been president of the section of pathology of the Royal Academy of Medicine in Ireland. During the early thirties he was one of those responsible for the foundation of the Medical Research Council of Ireland, of which he remained treasurer until his death. He was the first chairman of the National Blood Transfusion Association and was for many years pathologist to the National Maternity Hospital. He was a former assistant editor of the *Irish Journal of Medical Science*.

Such a busy professional life might well have left little scope for other activities, but his term as president of the Royal Zoological Society of Ireland—which controls the Dublin Zoo—was outstandingly successful. He was a keen fisherman and an enthusiastic photographer, and until lately one of his greatest pleasures was winter sports. He could speak with authority of most parts of Europe, for his holidays were almost always spent in travel, yet few can have known their own countryside so well.

CHARLES NOON

O.B.E., F.R.C.S.

Mr. Noon, senior consulting surgeon to the Norfolk and Norwich Hospital, died on Jan. 19 at the age of 71.

He was born in Leicester, where his father, the late Samuel Bilson Noon, practised as a solicitor. He was educated at Blairlodge, Stirlingshire, and studied medicine at St. Bartholomew's Hospital. After qualifying in 1910 he spent the next three years in house-posts at Barts, and his chiefs included Holburt Waring, Horder, Charles Gordon-Watson, and Francis Champneys. In 1914 he took the F.R.C.S. and the following year he was appointed chief assistant to the gynæcological department at Barts.

Noon first went to Norfolk when, early in the 1914–18 war, he was put in charge of the surgical division of the Norfolk War Hospital at Thorpe, and in 1919 he was appointed O.B.E. for his surgical work among the casualties from the Western front. The same year he was appointed assistant surgeon to the Norfolk and Norwich Hospital, and he was also surgeon in charge of the Ministry of Pensions orthopædic clinics and surgeon to the Ministry's limb-fitting centre at Norwich. In the next few years he joined the staffs of other local hospitals, including the Norwich Maternity Hospital, the Patrick Stead Hospital, Halesworth, St. Andrew's Hospital, Thorpe, and the Jenny Lind Hospital, Norwich. His private practice grew quickly, but he found time to keep up with advances in general medicine, for he was interested not only in surgery. He was the first surgeon to use radium at the Norfolk and Norwich Hospital.

During the late war he was group adviser to the Norfolk area of the Emergency Medical Service, and in 1943 he was appointed deputy regional adviser in surgery to the Ministry of Health. He retired from his hospital appointment in 1955, but he continued to sit as a member of the hospital management committee.

A colleague writes:

Noon was what we Norfolk people call a character. I shall never forget him going round the wards with the inevitable bowler on the back of his head, illustrating his observations on the patients from his wealth of aphorisms. Nor shall I forget his rare clinical acumen and his ability quickly to size up his patients. He had a pungent wit and could be outspoken in committee, and he had strong views on the Welfare State and what he considered bureaucratic medicine. At a first meeting his manner might seem abrupt, but those of us who knew him well knew also that nothing would prevent him from obeying any call for help. He was a keen and discriminating collector of first editions, old silver, and ivory.

Mr. Noon married in 1921 Cecily, daughter of Mr. F. W. South. She survives him with their son, Mr. C. F. Noon, F.R.C.S.

IVY EVELYN HASLAM

M.D. Lond., M.R.C.P.

Dr. Haslam, who died on Jan. 11 at the age of 79, was the first woman to take the M.R.C.P. when, in 1909, women were admitted to the examination.

As Ivy Woodward she was educated at Bromley High School, Bedford College, and the London School of Medicine for Women. After qualifying in 1903 she held house-appointments at the Royal Free Hospital and at the Belgrave Hospital for Children. Later she became assistant to the clinical pathologist, curator of the museum, and demonstrator in morbid histology at the Royal Free. She was also clinical assistant at the New Hospital for Women and the Royal Hospital for Diseases of the Chest before she was appointed medical registrar at the Royal Free Hospital. In 1908 when she took the M.D. Lond. she qualified for the gold medal.

In 1910 she married Dr. A. C. Haslam, who practised at Bromley, Kent. After her marriage she gave up regular medical work. She had two sons and three daughters (who survive her), and her family became her main concern, but throughout her life she never lost her interest in medicine. She also found time for wide cultural interests, especially in literature and languages. After her husband's death in 1927 she moved to Gerrard's Cross, and to support her growing family she took up infant-welfare and school-inspection work. Between 1931 and 1948 she held appointments as medical officer to infant-welfare clinics in Camberwell and Wandsworth. In 1948 she retired from all medical work and moved to London.

H. K. W., a fellow student at the Royal Free, writes:

Ivy Woodward's charming personality, keen sense of humour, and tolerance of other peoples' point of view made her popular with her colleagues and with her patients. As one of the visiting physicians at the Royal Free said, at a time when medical women were not accepted as they are today, "Her kindness and consideration for her patients are remarkable." It was regrettable that after her marriage she was able to do only a limited amount of medical work, a great loss to the profession of one so gifted.

ARTHUR HENRY CROOK

M.A., M.Chir. Camb., F.R.C.S.

Mr. A. H. Crook, formerly orthopædic surgeon to the Eastbourne group of hospitals, died on Jan. 19 at the age of 72. He was born at Southampton in 1884. From Cambridge he obtained an exhibition scholarship to Guy's Hospital. After qualifying in 1908 he held house-appointments at Guy's, and in 1911 he took the F.R.C.S. and in 1912 the M.CHIR. The same year he settled in practice in Eastbourne, and soon afterwards he was appointed assistant medical officer to the Princess Alice Hospital there. During the 1914-18 war he served with the Royal Navy in Antwerp, Gallipoli, when he was mentioned in dispatches, and later on the Somme and in Ireland.

On his return to his practice he took up his work at the Princess Alice Hospital, and in 1932 he became surgeon there. In 1936 he was due to retire, but the post of fracture surgeon was created for him and he held it till 1951. Up to last year he occasionally acted as a locum. In 1933 he helped to found the Eastbourne Sailing Club, and was in turn vice-commodore, commodore, and vice-president for life. He leaves a widow, three sons, and a daughter.

Mr. RUFUS THOMAS

C. A. B. writes:

In the long struggle over conditions of service of whole-time consultants Rufus Thomas took a leading part. His long service to the Whole-Time Consultants' Association, first as secretary and then as president, was recognised when he was made honorary member of the association. He gave evidence before the Royal Commission on Taxation of Profits and Income, and there and elsewhere he always presented his case in clear precise words and in a kindly and persuasive manner.

Notes and News

THE REMUNERATION CLAIM

REPRESENTATIVES of the Negotiating Committee are to meet the Minister of Health on the morning of Wednesday, Feb. 20. The full committee will meet on the afternoon of that day.

WORLD HEALTH ORGANISATION

Poland, Albania, and Bulgaria have informed the Director-General that they intend to resume active participation in W.H.O. this year.

Dr. A. T. Shousha, regional director for the Eastern Mediterranean, will be succeeded on Sept. 1 by Dr. A. H. Taba.

FAMINE IN IRELAND

THE Great Famine of 1845–52 was not the first nor the last period of acute distress in Ireland. It has, however, left an enduring mark on popular memory because of its duration and severity. Memories still linger in Irish oral tradition. A new study by a group of specialists in the period [1] contains seven sections, of which that by Sir William MacArthur, dealing with the medical history, may prove the most interesting to medical and other readers.

The cause of the famine was a fungus disease of the potato which appeared in the form of black spots on the leaves, with, on the under-surface, a whitish mould containing the spores. These were conveyed to other potato plants by wind and insects, particularly when the weather was warm and damp. The potato was almost the sole food of about a third of the population, and a main article of diet of a much larger proportion. On the heels of each famine there came an epidemic of fevers—mainly typhus and relapsing, both conveyed by the common louse of man. On one occasion cholera added to the disaster. Well over half a million people died. In the better classes relapsing fever was almost unknown, whereas typhus was contracted by many doctors and clergy from their attendance on the sick, and by members of the gentry who were infected in crowded assemblies either while presiding as magistrates, sitting on relief committees, attending as jurors, or helping to relieve the overwhelming distress by which they were surrounded. One out of every thirteen doctors died at their posts.

AUSTRIAN BIOGRAPHIES

Theodor Billroth once wrote to Johannes Brahms: "I have never met a great researcher . . . who was not basically an artist of a sort." The truth of this statement is borne out by reading (in German, French, or English) the concise biographies of 51 distinguished Austrian doctors that are contained in an interesting book [2] compiled by Professor Schönbauer and Dr. Marlene Jantsch. The proceeds will be used to provide subventions for scientific publications.

University of Cambridge

Dr. J. D. Lever, university lecturer in anatomy, has been elected to a staff fellowship at Trinity College on his appointment as college lecturer.

Queen's University, Belfast

At the summer graduation Air Marshal Sir James Kilpatrick will receive the honorary degree of LL.D. in recognition of his services for medicine in the Royal Air Force.

University of Birmingham

On Dec. 14 the following degrees were conferred:

M.D.—Roy Astley, B. D. Bower, M. G. Fitzgerald, T. A. Phillips, Rachel E. W. Sillett, G. F. Trobridge.

M.B., Ch.B.—Margaret J. Aldridge, G. H. Berry, K. G. Branch, D. C. Colwell, J. H. Croft, C. M. David, G. H. Davies, Marion K. Donovan, A. M. Evans, G. S. Farmer, I. M. Fletcher, D. M. Gardiner, N. H. N. Gardner, N. R. Houlston, J. W. E. Johnson, P. W. Lee, Barbara S. M. Marshall, D. H. Targett.

Mr. A. L. T. Easton has been appointed lecturer in obstetrics and gynæcology.

Sir Solly Zuckerman, F.R.S., will give the Sir Josiah Mason lectures during the 1957–58 session. He is to speak on control of population growth.

1. The Great Famine: Studies in Irish History, 1845–52. Edited by R. DUDLEY EDWARDS, professor of modern Irish history, University College, Dublin, and T. DESMOND WILLIAMS, professor of modern history, University College, Dublin. Dublin: Browne & Nolan. 1956. Pp. 517. 30s.
2. Österreichische Ärzte als Helfer der Menschheit. Notring Jahrbuch, 1957. Wien 1. Paperback 40, clothback 60, Austrian schillings.

Royal College of Obstetricians and Gynæcologists

At a meeting of council held on Jan. 26, with Sir Charles Read, the president, in the chair, the following were elected to the membership:

D. C. Aird, G. B. Batchelor, R. A. T. Boland, G. D. D. Cable, Mahomed Ismail Cassimjee, J. S. W. Chambers, Probhat Kumar Choudhuri, C. A. B. Clemetson, K. I. Digwood, Ammud Freier, W. J. Garrett, William Gault, William Gavin, Ivan Goldman, C. J. Goosen, Bernard Kirsch, Margaret A. Lakeman, E. W. Lillie, H. H. McCrostie, J. G. Markus, A. E. B. Matthews, T. T. E. Michael, A. B. Miller, Arun Kumar Mitra, Jessie M. B. Muirhead, A. G. Muttuthamby, A. B. L. Peake, A. C. C. Pinion, L. J. Rice, Ray Richards, T. J. Ryan, G. J. W. Stump, Sarosh Meher Thanevala, K. F. G. Wilson, Robert Yule.

North of England Obstetrical and Gynæcological Society

The following officers have been elected for 1957:

President, Mr. F. Stabler; vice-presidents, Dr. E. A. Gerrard, Mr. P. Malpas, Mr. H. Agar, Mr. G. R. MacDonald, Dr. W. Hunter; hon. treasurer, Mr. C. H. Walsh; hon. general secretary, Mr. F. J. Burk; hon. reporting secretary, Miss U. M. Lister.

Royal College of Physicians of London

Prof. J. R. Squire will deliver the Oliver-Sharpey lectures on Tuesday and Thursday, March 12 and 14, on the functions of the plasma proteins. Dr. L. C. Hill will give Lumleian lectures on Tuesday and Thursday, April 2 and 4, on systemic lupus erythematosus. All lectures will be held at 5 P.M. at the college, Pall Mall East, S.W.1.

Course on Child and Family Psychiatry

The department of child psychiatry of the Ipswich and East Suffolk Hospital is holding a course on this subject from April 8 to 12. The course has been recognised by the Ministry of Education for school medical officers and by the Ministry of Health for maternity and child-welfare officers. Further particulars may be had from 11, Fore Street, Ipswich.

International Congress on Occupational Health

This congress will be held at Helsinki from July 1 to 6. Subjects chosen for discussion at the plenary sessions include industrial noise, evaluation of invalidity, industrial hygiene norms, and human engineering. Further particulars may be had from Dr. Pertti Sumari, secretary-general of the congress, Työterveyslaitos, Haartmaninkatu 1, Helsinki, Finland.

Preventing Delay of Ambulances

From Feb. 1 ambulances bringing emergency cases into Edinburgh from the country are being met at the outskirts of the city by a gong-fitted escort car or ambulance manned by a driver who knows the district well, who will lead the incoming ambulance to the hospital by the quietest and quickest route. A similar scheme was introduced in Glasgow at the beginning of the year.

Visit to Baltic and U.S.S.R.

The Society for Cultural Relations with the U.S.S.R. hopes to organise for its medical section a Baltic cruise which will visit Copenhagen, Stockholm, and Helsinki, and spend 6–10 days in Leningrad and Moscow during September. Doctors, medical students, or members of their families—whether or not they are members of the society—are invited to apply for further particulars to the secretary, 14, Kensington Square, London, W.8.

Wellcome Trust

The Trust has announced further benefactions, amounting to £173,500, which bring the total distributed over the past twelve months to £491,500. The latest awards include the following:

Up to £35,000 to the University of Edinburgh for the cost of rebuilding animal houses at the Institute of Animal Genetics.

Up to £60,000 to the University of Leeds towards the cost of building research laboratories for medical physics and urology, on the site of the Leeds General Infirmary.

Up to £35,000 to the Royal College of Surgeons of England for the completion of the Wellcome Museums at the college.

Up to £13,000 to the University of Manchester for the cost of a mobile radiographic and laboratory unit for use primarily in field work on the rheumatic diseases.

Up to £15,000 to the University of St. Andrews for the cost of adding Wellcome Laboratories of Pharmacology to the Gatty Marine Laboratory.

The trustees have agreed, in principle, to present a motor-cruiser to the Medical Research Council to assist communication between the council's laboratories at Fajara on the Gambia River and the branch laboratory some 70 miles further up the river. This vessel would be adaptable as a mobile research laboratory for use in field studies in the interior of the Gambia territory.

Fellowship for South African Medical Graduates

The Eli Lilly medical research fellowship ($3000 p.a.) is open to South African doctors who wish to work in the United States. Further details can be had from Dr. H. A. Shapiro, P.O. Box 1010, Johannesburg, South Africa.

International Hospital Federation

This federation is to hold a congress at Lisbon, from June 3 to 7. The main theme will be International Coöperation for Hospital Development—the Hospital of the Future. Further particulars may be had from the secretariat of the federation, 10, Old Jewry, London, E.C.2.

Central Council for Health Education

The council's summer school will be held at Bangor, from Aug. 20 to 30. The subject will be the promotion of health and techniques of health education. Further details may be had from the medical director of the council, Tavistock House, London, W.C.1.

Royal Statistical Society

Frances Wood Prize.—This prize (50 guineas) is offered for the best investigation, on statistical lines, of a problem which bears directly or indirectly on economic or social conditions. Further particulars may be had from the hon. secretaries of the society, 21, Bentinck Street, London, W.1. The closing date for submission of essays is Sept. 30.

International Embryological Conference

This conference, which is sponsored by the *Journal of Embryology and Experimental Morphology*, will be held in the department of anatomy of the University of Cambridge from April 10 to 13. Copies of the programme may be had from Mr. D. R. Newth, PH.D., department of zoology, University College, London, W.C.1.

N.H.S. Superannuation Concession

Medical and dental practitioners and part-time specialists in the National Health Service who elected to receive a contribution of 8% of their superannuable remuneration towards payment of premiums on their insurance policies instead of joining the service's superannuation scheme may now be allowed to substitute for the original policies recognised for purposes of the option, annuity policies which would qualify for the new income-tax relief afforded under section 22 of the Finance Act, 1956. Recognition of the substituted policies and payment of the Minister's contribution in respect of them will be subject to the following conditions:

Where the original policy is made into a paid-up policy, that policy shall not be assigned or otherwise surrendered before maturity date. A breach of this condition would lead to the discontinuance of the 8% contribution.

Where the original policy is surrendered all the money derived therefrom shall be used in the purchase of the substituted policy.

Applications for approval to substitute policies should be sent to the Health Services Superannuation Division, Government Buildings, Honeypot Lane, Stanmore, Middlesex.

Prof. W. C. W. Nixon has been elected a member of the World Health Organisation's expert advisory panel on maternal and child health.

The Distillers Company (Biochemicals) Limited have moved their sales division to Broadway House, The Broadway, London, S.W.19.

Appointments

CADOGAN, E. P., M.B. Madras, D.P.M.: assistant psychiatrist (S.H.M.O.), Storthes Hall Hospital, Kirkburton, near Huddersfield.

COUCH, R. S. C., M.D. Lond., M.R.C.P., F.F.R., D.M.R.D.: assistant radiologist, St. Thomas's Hospital, London.

DAVIES, R. G., M.D. Lond., D.P.H.: M.O.H. and school M.O., Huddersfield.

EVANS, O. L., M.B. Lpool, D.P.H.: M.O.H., Leominster, Bromyard, Kington and district.

GORE, C. P., M.D. Dubl., M.R.C.P.I., D.P.M.: consultant psychiatrist and physician-superintendent, Menston Hospital, near Leeds.

LANCASTER, N. P., M.D. Manc., D.P.M.: consultant psychiatrist, Bristol mental hospitals.

LISTER, JEREMY, M.R.C.S., D.C.H.: assistant psychiatrist (S.H.M.O.), Cefn Coed Hospital, Swansea.

MILL, W. A., M.S. Lond., F.R.C.S.: consultant E.N.T. surgeon, Royal Masonic Hospital, London.

MILNE, A. C., M.B. Aberd., F.F.A.R.C.S., D.A.: consultant anæsthetist, northern group of hospitals and department of surgical neurology, Edinburgh Royal Infirmary and Bangour Hospital.

TAYLOR, R. M., M.B. Manc., D.P.M.: assistant psychiatrist, Birmingham (mental C) group of hospitals.

Diary of the Week

FEB. 3 TO 9

Tuesday, 5th

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.1
5 P.M. Dr. D. D. Reid: Environmental Factors in Respiratory Disease. (First of two Milroy lectures.)

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.2
3.45 P.M. Dr. G. T. Allen: Histological Variations in Basal Cell Tumours. (Erasmus Wilson demonstration.)

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, London, W.1
8.30 P.M. *Orthopædics.* Mr. Denys Wainwright: Transcervical Fracture. Mr. R. H. Maudsley: Relief of Pain in Paget's Disease. Mr. B. H. Brock: Hydrocortisone Therapy in Tennis Elbow.

BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1.) Dr. N. B. Myant: Biliary Excretion of Thyroid Hormone.

ST. MARY'S HOSPITAL MEDICAL SCHOOL, Paddington, W.2
5 P.M. Mr. David Gordon: Unusual Lesions of the Vulva.

ROYAL ARMY MEDICAL COLLEGE, Millbank, London, S.W.1
5 P.M. Dr. J. T. Scales: Metals and Plastics in the Treatment of Disease.

INSTITUTE OF DERMATOLOGY, Lisle Street, W.C.2
5.30 P.M. Dr. R. T. Brain: Electrotherapeutic Techniques.

Wednesday, 6th

ROYAL SOCIETY OF MEDICINE
5.15 P.M. *History of Medicine.* Dr. Douglas Guthrie: Whither Medical History? (Presidential address.)
8 P.M. *Surgery.* Mr. M. Hobsley: Surgical Significance of the Internal Architecture of the Liver. Mr. K. F. Wood: Carcinoma of the Adrenal Cortex without Endocrine Effects. Mr. Henry Wapshaw: Diagnosis of Acute Pancreatitis. Mr. B. N. Catchpole: Massive Thrombophlebitis. Mr. O. Daniel: Serious Postoperative Bleeding Due to Acquired Defects of the Coagulation Mechanism.

POSTGRADUATE MEDICAL SCHOOL OF LONDON, Ducane Road, W.12
2 P.M. Dr. Alick Isaacs: Influenza and Adeno Viruses.

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. R. W. Riddell: Laboratory Procedures for Mycotic Infections.

INSTITUTE OF DISEASES OF THE CHEST, Brompton, S.W.3
5 P.M. Mr. T. Holmes Sellors: Surgical Treatment of Pulmonary Stenosis.

MIDLAND MEDICAL SOCIETY
8.15 P.M. (Birmingham Medical Institute, 154, Great Charles Street, Birmingham, 3.) Dr. H. W. Donovan, Dr. C. F. Hawkins, Prof. E. Brodie Hughes, Dr. L. Nagley: Relief of Pain.

LIVERPOOL MEDICAL INSTITUTION, 114, Mount Pleasant, Liverpool, 3
8 P.M. Prof. J. H. Dible: Pathology of Peripheral Ischæmia.

MANCHESTER MEDICAL SOCIETY, Medical School, University of Manchester
4.30 P.M. Mr. T. W. Hibbert: Wines and Sherries.

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH
8.30 P.M. (Royal College of Surgeons, 18, Nicolson Street.) Dr. J. R. Paterson, Dr. John Macaskill: Cataract Operations.

Thursday, 7th

ROYAL SOCIETY OF MEDICINE
8 P.M. *Neurology.* Dr. Denis Hill, Dr. B. G. Parsons-Smith, Dr. J. A. V. Bates: Changing Values in Electroencephalography.

ROYAL COLLEGE OF PHYSICIANS OF LONDON
5 P.M. Dr. Reid: Environmental Factors in Respiratory Disease. (Second of two Milroy lectures.)

UNIVERSITY COLLEGE, Gower Street, W.C.1
5.15 P.M. Prof. Franz Bergel, D.SC.: Chemical Aspects of Psychopharmacology.

BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (London School of Hygiene and Tropical Medicine.) Dr. H. M. Sinclair: Vitamins in Nutrition.

UNIVERSITY OF ST. ANDREWS, Queen's College, Small's Wynd, Dundee
5 P.M. Dr. Sheila Sherlock: Hepatic Coma.

Friday, 8th

POSTGRADUATE MEDICAL SCHOOL OF LONDON
10 A.M. Prof. F. R. Winton: Renal Circulation.

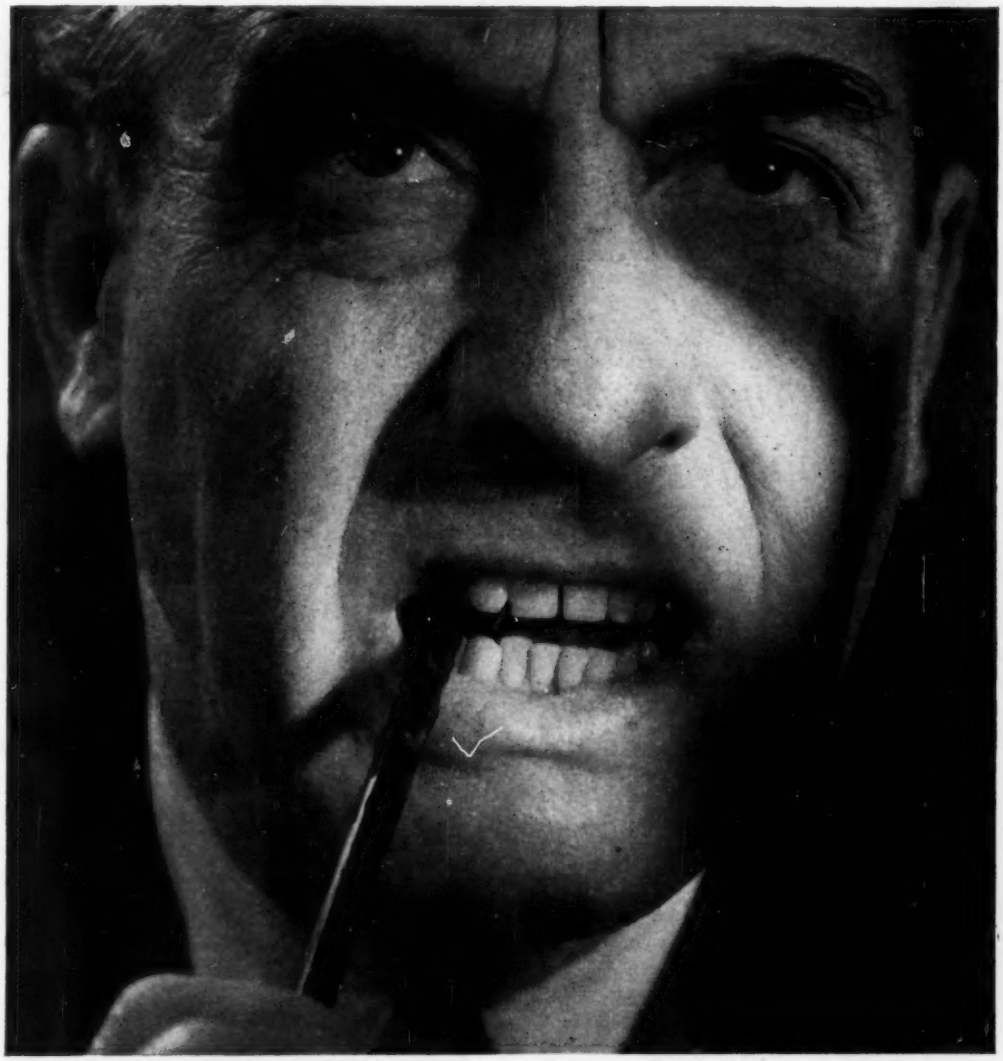
INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn Road, W.C.1
3.30 P.M. Mr. C. Gill-Carey: Tinnitus.

UNITED KINGDOM COMMITTEE FOR THE WORLD FEDERATION FOR MENTAL HEALTH
5.45 P.M. (County Hall, Westminster Bridge, S.E.1.) Dr. Margaret Mead: Mental Health in a Changing World.

MIDLAND CENTRE FOR NEUROSURGERY, Holly Lane, Smethwick, near Birmingham
8 P.M. Sir Francis Walshe, F.R.S.: Ætiology and Nature of the So-called Traumatic Neurosis.

CORRIGENDUM: *A New Acetabular Reamer for Arthroplasty.*—The device described by Mr. R. B. Duthie (*Lancet*, 1956, ii, 1085) is manufactured in Great Britain by Zimmer Orthopædic Ltd., Bridgend, Glam., and not by an American company.

ASPECTS OF A CONDITION



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REPORT OF THE GOVERNMENT COMMITTEE ON SYNTHETIC DETERGENTS, 1956

THE VITAL ROLE OF DETERGENTS TO-DAY

Since their introduction six years ago the new washing products, now generally known as "detergents," have revolutionised British household washing. This is because they give superior performance in hard water, leave clothes and dishes demonstrably cleaner, and leave no dulling film as soaps usually do.

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Specifically, research has shown that Tide, the most popular of the new detergents, is as mild as other general-purpose soap powders.

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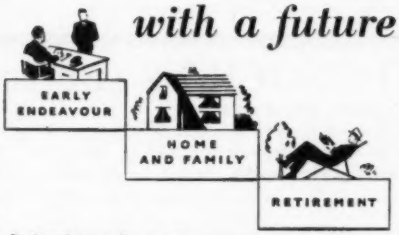

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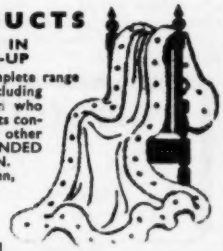

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The Terms and Conditions of Service of Hospital Medical and Dental Staff apply to all N.H.S. hospital posts we advertise, unless otherwise stated. Canvassing disqualifies, but candidates may normally visit the hospital by appointment.

Academic and Educational

UNIVERSITY OF LONDON

INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY

(Incorporating the teaching facilities of Queen Charlotte's Maternity Hospital, Chelsea Hospital for Women and the Department of Obstetrics and Gynæcology at Hammersmith Hospital)

Applications are invited from graduates, with a registrable qualification, for enrolment for the SPRING TERM (4TH MARCH–1ST JUNE, 1957). Graduates attend each of the constituent hospitals in turn for clinical work, and attend lectures and special demonstrations at all 3 hospitals. Enrolment Fee £3. Tuition Fee £36 a term.

General practitioners wishing further experience in obstetrics may be accepted to attend the course at Queen Charlotte's Maternity Hospital for shorter periods—i.e., 2–4 weeks. They will have the opportunity of attending the labour ward in addition to combined classes of lectures and demonstrations at the 3 hospitals of the Institute. Ministry of Health grants are payable to approved general practitioners attending for a period of 2 weeks.

AN INTENSIVE COURSE for those preparing for M.D. and M.R.C.O.G. will be held from 3RD JUNE–15TH JUNE, 1957.

During the winter vacation, a limited number of graduates may attend the practice of the hospitals.

A Refresher Course for General Practitioners will be held from 25th February–2nd March, 1957, and another from 17th June–22nd June, 1957.

Hostel accommodation is available at Queen Charlotte's Hospital and at Hammersmith Hospital.

Further particulars can be obtained from the Secretary, Institute of Obstetrics and Gynæcology, Chelsea Hospital for Women, Dovehouse-street, London, S.W.3.

UNIVERSITY OF EDINBURGH

FACULTY OF MEDICINE

UNIVERSITY (FELLOWSHIPS, SCHOLARSHIPS AND BURSARIES) SCHEME, 1953

In terms of the above-named Scheme, certain funds have been amalgamated to form a Medical Faculty Scholarship Fund, from which awards of Fellowships and Scholarships will be made under the following conditions :—

GRADUATE RESEARCH SCHOLARSHIPS

4 Research Scholarships are offered for award, each tenable for 1 year and, in certain circumstances, renewable for a second year. For the first year the minimum value of the Scholarships shall be £500, and for the second year £600.

The Scholarships shall be open to graduates in the Faculty of Medicine of any University ; to graduates in the Faculties of Arts or Science of any University who hold an Honours Degree ; and to licentiates in Medicine.

The Scholarships shall not be open for award to any applicant who, excluding any period spent in National Service, has held a degree or licence for longer than 3 years.

Those to whom awards are made shall be required to undertake research work in a department within the Faculty of Medicine.

The Research Scholarships will normally be awarded at the beginning of each academic year in OCTOBER.

GRADUATE RESEARCH FELLOWSHIPS

3 Research Fellowships are offered for award, each tenable for 1 year, renewable for a second year and, in special circumstances, for a third year. For the first year, the minimum value of the Fellowships will be £700 ; for a second year, £800 ; and, where awarded for a third year, £900.

The Fellowships shall be open to graduates in the Faculty of Medicine of any University ; to graduates in the Faculties of Arts or Science of any University who hold an Honours Degree ; and to licentiates in Medicine.

Those to whom awards are made shall be required to undertake research work in a department within the Faculty of Medicine.

The Research Fellowships will normally be awarded at the beginning of each academic year in OCTOBER.

Applications for the Graduate Research Scholarships or Fellowships (which are to be made on a prescribed application form obtainable from the Faculty of Medicine Office) must be submitted, through the Head of the Department concerned, to the Dean of the Faculty of Medicine, University New Buildings, Teviot-row, Edinburgh, 8, by 30th April in the year of award, and should be accompanied by a statement of the work which the applicant proposes to undertake.

GEORGE L. MONTGOMERY, Dean of the Faculty of Medicine.

THE ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE

THE DIPLOMA IN PUBLIC HEALTH
THE DIPLOMA IN INDUSTRIAL HEALTH

The next COURSES OF INSTRUCTION for the above Diplomas will commence on 15TH MARCH, 1957. Tuition may be taken whole-time or part-time.

Prospectuses, enrolment forms and full details may be obtained from the Secretary, 28, Portland-place, London, W.1 (telephone: LANgham 2731/2).

CORNEO-PLASTIC UNIT AND REGIONAL EYE BANK

QUEEN VICTORIA HOSPITAL, EAST GRINSTEAD

A SERIES OF LECTURE DEMONSTRATIONS to illustrate the relationship of ophthalmic and plastic surgery has been arranged as follows :—

(1) 2ND FEBRUARY at 2 P.M.—Keratoplasty.
(2) 2ND MARCH at 2 P.M.—The Surgery of Lacrimation.
(3) 9TH MARCH at 2 P.M.—Ptosis.
(4) 6TH APRIL at 2 P.M.—The Surgery of the Conjunctiva and Socket : also post-traumatic and positional diplopia.

Each Demonstration consists of a lecture, illustrative operations, demonstration of cases and pathology, and discussion.

Numbers will be limited to 12 surgeons.

For further particulars apply to the Secretary, Corneo-Plastic Unit, Queen Victoria Hospital, East Grinstead.

PADDINGTON GROUP HOSPITAL MANAGEMENT COMMITTEE

THE TAVISTOCK CLINIC

DISCUSSION GROUP SEMINAR ON PSYCHOLOGICAL PROBLEMS IN SPECIALIST AND HOSPITAL PRACTICE

A course of 8–10 discussion meetings for a limited number of Consultants and other senior medical hospital staff ; held on TUESDAY evenings. Admission free.

Apply in writing for further particulars to Medical Director, Tavistock Clinic, 2, Beaumont-street, W.1.

BEIT MEMORIAL FELLOWSHIPS FOR MEDICAL RESEARCH

Notice is hereby given that an election of Junior Fellows to begin work on 1ST OCTOBER next will take place in May, 1957. Junior Fellowships have successive annual values £800, £850 and £900, for 3 years. As a rule, superannuation benefits are provided, to which the successful candidates will be required to contribute 5% of the annual stipend and to which the Trust will make a contribution of 10%. Candidates must have a degree in a faculty of a university approved by the Trustees in Her Majesty's Dominions, Protectorates and Mandated Territories, India, Pakistan and the Republic of Ireland or a medical diploma registrable in the United Kingdom. Elections to Junior Fellowships are rarely made above the age of 35 years.

Applications from candidates must be received not later than 1st April. Candidates must submit evidence that they can be given accommodation in the departments where they propose to work, which must be either in Great Britain or Ireland.

Forms of application and all information may be obtained by letter only, addressed to the Secretary, Beit Memorial Fellowships for Medical Research, The Lister Institute, Chelsea Bridge-road, London, S.W.1. From overseas candidates forms of applications may be obtained from the Secretary, South African Medical Council, P.O. Box 205, Pretoria, South Africa ; the Director, Commonwealth Office of Education, Box 3879, Sydney, Australia ; the Department of Health, Wellington, New Zealand ; and the Canadian Medical Association, 244, St. George-street, Toronto, Canada.

CHARING CROSS HOSPITAL MEDICAL SCHOOL. ASSISTANT LECTURER IN CLINICAL PATHOLOGY will be attached to the Department of Clinical Pathology and will be required to give such assistance as the Head of the Department may desire in lecturing, demonstrating and practical instruction and in the routine hospital investigations. A medical qualification is essential. The candidate appointed will be expected to engage in research and generally to promote the welfare of the Department and of the Medical School. The appointment is a whole-time one and the successful candidate will be required to begin his duties on 1st February, 1957, or as soon as possible thereafter. The appointment will in the first place be for a period of 2 years and the commencing salary will be £900 p.a., with an increment of £50 for the second year. Subject to satisfactory service the appointment may be continued on the establishment in the Lecturer grade, the salary for which is £1000 p.a.–£100–£1300 p.a. If continued the post will be superannuated and family allowances will be paid where applicable at the rate of £50 p.a. per child of educational age. 3 months notice of termination of the appointment shall be given by either side.

Applications on the prescribed form must be sent to the Secretary, Charing Cross Hospital Medical School, 62–65, Chandos-place, London, W.C.2, and must be received not later than first post on Thursday, 21st February, 1957.

THE UNIVERSITY OF LEEDS. Department of Paediatrics AND CHILD HEALTH. Applications are invited for appointment as LECTURER in the Department of Pædiatrics and Child Health at a salary on the scale £1100–£100–£1700 a year, according to qualifications and experience. In addition to teaching and research, the duties include clinical hospital work and work with Local Authority clinics.

Applications (3 copies), stating date of birth, qualifications and experience, together with the names of 3 referees, should reach the Registrar, The University, Leeds, 2 (from whom further particulars may be obtained), not later than 15th February, 1957.

UNIVERSITY OF LEEDS, UNITED LEEDS HOSPITALS. Applications are invited for the post of SENIOR REGISTRAR AND TUTOR IN PSYCHIATRY. The successful candidate will be a member of the University Department of Psychiatry and the duties will include work at the General Infirmary at Leeds with which the University Department is associated and such other duties as may be assigned to him by the Head of the University Department.

Applications (3 copies), stating date of birth, qualifications, and details of present and previous appointments with dates, and experience of teaching, together with the names of 3 referees, should reach the Registrar, The University, Leeds, 2 (from whom further particulars may be obtained), not later than 9th February, 1957.

UNIVERSITY COLLEGE, Ibadan, Nigeria. Applications are invited for following posts in the Department of Pathology :—
SENIOR LECTURER or LECTURER IN HÆMATOLOGY.
LECTURER IN MORBID ANATOMY.

Appointments dating from early 1957 for 3 years in first instance. Salary scales at present : Senior Lecturer, £1850–£100–£2450 p.a. ; Lecturer, £1700–£100–£2100 p.a. Allowance for up to 3 children £50 p.a. per child for children resident in Nigeria, £100 p.a. per child for children resident elsewhere. Part furnished accommodation at rent not exceeding 7.7% of salary. Passages for appointee, wife and up to 3 children under 11 years on appointment, overseas leave and termination. F.S.S.U. Outfit allowance £60.

Detailed applications (10 copies), naming 3 referees, by 4th March, 1957, to Secretary, Senate Committee on Colleges Overseas in Special Relation, Senate House, London, W.C.1, from whom further particulars may be obtained.

UNIVERSITY OF LONDON. Applications are invited for IMPERIAL CHEMICAL INDUSTRIES RESEARCH FELLOWSHIPS in Biochemistry, Chemistry, Chemotherapy, Engineering, Metallurgy, Pharmacology, Physics and subjects allied to Chemistry or Physics. The Fellowships will be of the value of £800 p.a. and will normally be tenable from 1st October, 1957, for 3 years in the first instance. Family allowances and F.S.S.U.

Detailed regulations and application forms may be obtained from the Academic Registrar, University of London, Senate House, W.C.1. Applications must be received not later than 30th April, 1957.

UNIVERSITY OF LONDON. Applications are invited for a TURNER AND NEWALL RESEARCH FELLOWSHIP in Engineering, Inorganic Chemistry, Physics or an allied subject. The Fellowship will be of the value of £800 p.a. and will normally be tenable from 1st October, 1957, for 3 years in the first instance. Family allowances and F.S.S.U.

Detailed regulations and application forms may be obtained from the Academic Registrar, University of London, Senate House, W.C.1. Applications must be received not later than 30th April, 1957.

Hospital Services : Senior Appointments

CHARING CROSS HOSPITAL GROUP. - Wembley HOSPITAL. Part-time CONSULTANT ANÆSTHETIST (1 attendance per week). Candidates, who should specialise in anæsthetics and have the D.A. and the F.F.A.R.C.S., should submit 12 copies of their applications, stating date of birth, qualifications and experience, with the names of 3 referees, to reach the undersigned by 28th February, 1957.

FRANK HART, Secretary to the Board.

Charing Cross Hospital, London, W.C.2.

GUY'S HOSPITAL, London, S.E.1. The Board of Governors invites applications for the appointment of CONSULTANT ANÆSTHETIST, for attendance on 5 sessions per week. Candidates should hold a high qualification or the F.F.A.R.C.S. The conditions of service will be in accordance with the terms and conditions of service of hospital medical staff.

Applications (1 copy), together with the names of 3 referees, should be lodged with the Superintendent, Guy's Hospital, London Bridge, S.E.1, not later than 14th February. In accordance with Statutory Instrument No. 1259 of the National Health Service regulations, canvassing members of the Board or Advisory Appointments Committee will lead to disqualification.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.

(1) CHILD PSYCHIATRIST (4 half-days a week), Senior Hospital Medical Officer grade, Bedfordshire Child Guidance Service. Duties in northern part of the County based on the Clinic at 3, St. Peter's-street, Bedford. May be visited by arrangement with the County Medical Officer, Bedfordshire County Council, Phoenix Chambers, High-street, Bedford.

Applications before 4th March, 1957.

(2) CONSULTANT ANÆSTHETIST (3 half-days a week), King Edward Memorial Hospital, Ealing, W.13 (151 Beds). Operating sessions Monday mornings and Tuesday afternoons, and at Clayponds Wing on Wednesday mornings.

Applications before 6th March, 1957.

(3) CONSULTANT E.N.T. SURGEON (2 half-days a week), St. Mary's Cottage Hospital, Hampton, Middlesex (24 Beds).

Applications before 11th March, 1957.

(4) ASSISTANT PSYCHIATRIST (whole-time), Senior Hospital Medical Officer grade, Leavesden Hospital, Abbots Langley, Herts. (2378 Beds—mental deficiency). Accommodation for married man available.

Applications before 13th March, 1957.

Hospitals may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SPRINGFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of Temporary SENIOR HOSPITAL MEDICAL OFFICER at the above Hospital. Previous mental hospital experience essential. The Hospital is a large one and offers excellent experience in diagnosis and treatment of all forms of mental disorder including the neuroses. Every variety of modern treatment is carried out in a well-equipped treatment centre. Single accommodation is available. Candidates may visit the Hospital by arrangement.

Apply to the Medical Superintendent, Springfield Hospital, Tooting, S.W.17.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Whole-time ASSISTANT RADIOLOGIST (Senior Hospital Medical Officer grade) in the Lambeth Group, for duty in the X-ray Diagnostic Department at Lambeth Hospital, S.E.11, and South Western Hospital, S.W.9, under the general guidance of the Consultant. Candidates should have D.M.R.

Applications by letter (5 copies), giving date of birth, qualifications, experience, and names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 23rd February, 1957. Applicants may visit hospitals by local arrangement.

MANCHESTER REGIONAL HOSPITAL BOARD. Applications invited for post of CONSULTANT OBSTETRICIAN/GYNÆCOLOGIST (8 half-days weekly) at Park Hospital, Davyhulme, Manchester (general, total 433, including 72 obstetric and 30 gynæcological, beds). The Consultant appointed may be invited to undertake medical administrative responsibility for the Maternity Department as a whole. Successful applicant to reside in area.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by 19th February, 1957.

LEEDS REGIONAL HOSPITAL BOARD. Applications are invited from medical practitioners for the appointment of ASSISTANT SENIOR MEDICAL OFFICER (salary scale £1680–£80(4)–£100(1)–£2100 p.a.) on the staff of the Senior Administrative Medical Officer at the Board's Headquarters, Harrogate, for duties in connection with the organisation and planning of the Hospital and Specialist Services of the Region. Previous experience of medical administration in the Hospital and/or Public Health Service would be an advantage.

Applications, with full details of qualifications and experience together with the names of 3 referees, to the Secretary, Park-parade, Harrogate, by 23rd February, 1957.

LEEDS REGIONAL HOSPITAL BOARD.

Part-time CONSULTANT in Anæsthetics (9 notional half-days per week) for duties at hospitals in Pontefract and Goole. The person appointed to reside in Pontefract.

Whole-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer scale) for duties at Clifton Hospital, York (1112 Beds), and associated clinics at Harrogate, York, and Scarborough. The person appointed may also have duties at Claypenny Hospital for Mental Defectives (1 session per week). Small flat available.

Applications (12 copies), stating age, qualifications and details of present and previous appointments with dates, together with the names and addresses of 3 referees, to the Secretary, Park-parade, Harrogate, by 21st February, 1957.

AMENDED ADVERTISEMENT

NEWCASTLE REGIONAL HOSPITAL BOARD. Assistant PATHOLOGIST (Senior Hospital Medical Officer grade) (whole-time or maximum part-time according to the wishes of the applicant) for the Regional Cancer Service with main duties at the Queen Elizabeth Hospital, Gateshead, which includes a Gynæcological Cancer Unit of 34 Beds. Special experience in gynæcological cytology essential.

Further particulars may be obtained from Senior Administrative Medical Officer to the Board, Benfield-road, Newcastle upon Tyne, 6, to whom applications should be addressed within 14 days, together with names and addresses of 3 referees.

OXFORD REGIONAL HOSPITAL BOARD. Consultant RADIOLOGIST (whole-time or maximum part-time) to the hospitals of the Kettering/Northampton Area Department in Radiology. Duties mainly at the hospitals of the Kettering Hospital Management Committee, including Corby Diagnostic Centre, with some duties at Northampton General Hospital and the peripheral units. The successful candidate will be required to live in the Kettering area. Kettering is included in the list of hospitals due for major development schemes. Applicants must hold a recognised Diploma in Radiology and a higher qualification in medicine or surgery is desirable.

Applications (12 copies), stating age, qualifications, experience, and the names of 3 referees, should reach the Secretary of the Board, 43, Banbury-road, Oxford, by 2nd March.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT RADIOLOGIST for Leicester Royal Infirmary and Leicester General Hospital. The successful candidate will work under the direction of the Consultant Radiologist-in-charge, and will be required to reside within 10 miles of the Leicester Royal Infirmary. Candidates should possess a Diploma in Radiology. Salary scale £1575–£50–£2025.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10. Forms to be returned by 2nd March, 1957.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SENIOR ASSISTANT PSYCHIATRIST required for Middlewood Hospital, Sheffield. Salary scale £1575–£50–£2025.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 23rd February, 1957.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT RADIOLOGIST (Senior Hospital Medical Officer grade) required for the Nottingham General Hospital. Successful candidate will work under the direction of the Consultant-in-charge and will be required to undertake occasional sessions at other hospitals in the Nottingham area. Salary scale £1575–£50–£2025.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 23rd February, 1957.

SHEFFIELD REGIONAL HOSPITAL BOARD. CONSULTANT THORACIC SURGEON (maximum part-time) required. Main duties at Nottingham City Hospital with duties at other hospitals in the area.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10. Forms to be returned by 23rd February, 1957.

NEW ZEALAND. WAIKATO HOSPITAL, Hamilton, NEW ZEALAND. Applications are invited from suitably qualified medical practitioners of the British Empire for the position of Full-time ORTHOPÆDIC SURGEON at the above Hospital. Preference will be given to applicants possessing postgraduate degrees.

Salary in accordance with the Hospital Employment (Medical Officers) Regulations as either :—

(*a*) Senior Registrar £N.Z.970–£N.Z.1130 plus an allowance of £N.Z.200 in lieu of residence or :—

(*b*) Junior Specialist £N.Z.1600–£N.Z.1900 (non-resident). An allowance will be paid on arrival, towards travelling expenses incurred, in travelling to take up appointment.

Conditions of appointment and form of application are available from the Office of the High Commissioner for New Zealand, 415, Strand, London, W.C.2. Applications close with the Secretary, P.O. Box 934, Hamilton, New Zealand, Thursday, 18th April, 1957. A. C. BURGESS, Secretary.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS AND THE SHEFFIELD REGIONAL HOSPITAL BOARD. Applications are invited for the post of CONSULTANT DERMATOLOGIST (maximum part-time). It is expected that the successful candidate will spend 6 notional half-days at the Royal Infirmary under the Board of Governors of The United Sheffield Hospitals and 3 notional half-days with the Regional Board at Doncaster Gate Hospital, Rotherham, and at the City General Hospital, Sheffield.

Applications (16 copies), stating age, qualifications and experience, with the names and addresses of 3 referees, should be sent not later than 2nd March, 1957, to the Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1, from whom further details may be obtained.

Hospital Services : Junior Appointments

BROMPTON HOSPITAL, S.W.3. Applications invited for the post of NON-RESIDENT HOUSE PHYSICIAN for which there are 3 vacancies, for 6 months from 1st April, 1957. Duties include work in Outpatient Department and wards. Salary at the rate of £525 p.a.

Applications, stating age, qualifications with dates, nationality, and appointments held, together with copies of testimonials, by 9th February, 1957, to—

KENNETH A. F. MILES, House Governor.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. SENIOR HOUSE OFFICER required in the Pathology Department. Good training in all branches of pathology. Hospital may be visited by arrangement. Position vacant 1st April, 1957.

Applications, with names of 2 referees, to Medical Director by 16th February, 1957.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. RESIDENT HOUSE OFFICER required for General Surgical and Urological Department. Post-registration appointment for 6 months from 1st March, 1957. Post recognised for F.R.C.S.

Applications, with copies of 2 testimonials, to Medical Director, by 9th February, 1957.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. RESIDENT HOUSE OFFICER (pre-registration), required in General Medical and Cardiological Department. Appointment for 6 months from 22nd March, 1957.

Applications, with copies of 2 testimonials, to Medical Director by 9th February, 1957.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. RESIDENT SENIOR HOUSE OFFICER required for Casualty Department. Successful candidate will work under supervision of Orthopædic and Traumatic Specialist. Appointment for 6 months from 12th March, 1957.

Applications, with names of 2 referees or copies of 2 testimonials, to Medical Director by 16th February, 1957.

FOUNTAIN HOSPITAL, Tooting-grove, London, S.W.17. SENIOR REGISTRAR required for a 3-year appointment for clinical research at the Fountain Hospital for mentally defective children. Candidates should have an interest in pædiatrics or neuropsychiatry and some experience of research methods. Applicants may visit the Fountain Hospital or obtain further information by writing.

Application forms from the Group Secretary.

HACKNEY HOSPITAL, London, E.9. (General—841 Beds.) Applications are invited for the 6-months resident appointment from 3rd March of Pre-registration HOUSE PHYSICIAN (first post) and should reach the Secretary, above address, by 15th February, quoting HH/PHP.

HAMMERSMITH HOSPITAL AND POSTGRADUATE MEDICAL SCHOOL, Ducane-road, London, W.12. RESIDENT HOUSE PHYSICIAN (pædiatrics) required 1st April. Post recognised for D.C.H.

Applications, stating age, qualifications, experience, copies of 2 recent testimonials, to Secretary, Board of Governors, by 9th February.

HIGHLANDS GENERAL HOSPITAL, Winchmore Hill, N.21. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR (general surgery), vacant 4th March. 50 acute surgical beds and a wide variety of general surgical problems are seen. Modern operating theatres. Candidates must have some previous operative experience (F.R.C.S. or holders of Primary preferred). Recognition for F.R.C.S.

Application forms obtainable from, and returnable to, Secretary, Northern Group Hospital Management Committee, Royal Northern Hospital, Holloway, N.7, by 12th February.

HIGHLANDS GENERAL HOSPITAL, Winchmore Hill, N.21. HOUSE SURGEON required. Duties mainly orthopædic with some E.N.T. and emergency general surgery. New operating theatre, Outpatient and Casualty Department. Post recognised for Pre-registration Service.

Applications, with copies of 3 testimonials, and name and address of 1 referee, to Hospital Secretary.

LANGTHORNE HOSPITAL, London, E.11. Leytonstone NO. 10 HOSPITAL GROUP. Applications are invited for the post of HOUSE OFFICER in the Group Geriatric Unit at above Hospital. The post offers excellent scope for persons interested in this specialty as the most modern methods of geriatric treatment are employed, supervised by a Consultant Geriatrician, with full consultant services in other branches.

Application forms from the Senior Medical Officer, Langthorne Hospital, London, E.11, to be returned by 11th February, 1957.

LEWISHAM HOSPITAL, London, S.E.13. Applications are invited for the post of SENIOR HOUSE OFFICER (urology), vacant immediately and recognised for 6 months training for F.R.C.S. Salary £745 p.a., less £150 for residential emoluments.

Applications, stating age, qualifications and experience, with copy testimonials or names of referees, to Group Secretary, Lewisham Hospital, S.E.13.

LONDON CHEST HOSPITAL. Hospitals for Diseases of THE CHEST. A vacancy occurs 1st April, 1957, for RESIDENT HOUSE SURGEON at the Hospital's Country Branch, near Hitchin and Letchworth, Herts. The post is graded as Senior House Officer and the appointment, which provides excellent opportunities for experience in thoracic surgery, is for 6 months.

Applications from registered medical practitioners, stating date of birth, qualifications with dates, and previous appointments held, with copies of 3 testimonials, should reach the undersigned not later than 12th February.

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

LONDON CHEST HOSPITAL. Hospitals for Diseases of THE CHEST. 2 vacancies occur 1st April, 1957, for RESIDENT HOUSE PHYSICIAN. Appointment for 6 months, 4 in London, 2 at the Country Branch, near Letchworth, and post graded as House Officer. Duties include the Outpatient Department and refill clinic as well as wards.

Applications, stating date of birth, qualifications with dates, and previous appointments held, with copies of 3 testimonials, should reach the undersigned not later than 12th February.

THOMAS BROWN House Governor.

London Chest Hospital, E.2.

LONDON HOSPITAL, Whitechapel, E.1, AND THE NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of SENIOR REGISTRAR in General Surgery becoming vacant on 1st April, 1957. Candidates must be Fellows of the Royal College of Surgeons. The appointment will be for 1 year renewable for a maximum of 4 years, the first 2 years will be spent at The London Hospital, the third and fourth years at Poplar Hospital or in a special department.

Applications (12 copies), giving the names and addresses of 3 referees, should be received by the undersigned by 12th February, 1957. H. BRIERLEY, House Governor.

LONDON HOSPITAL, Whitechapel, E.1, AND THE NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of SENIOR REGISTRAR to the Obstetric and Gynæcological Department becoming vacant on 21st March, 1957. Candidates must hold a higher qualification. The appointment will be for 1 year, renewable for a maximum of 4 years, the first 2 years will be spent at The London Hospital and the remainder at Rochford General Hospital, Rochford.

Applications (12 copies), giving the names and addresses of 3 referees, should be received by the undersigned by 12th February, 1957. H. BRIERLEY, House Governor.

LONDON HOSPITAL, Whitechapel, E.1, AND THE NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of SENIOR REGISTRAR to the Department of Anæsthetics, becoming vacant on 9th April. Candidates must hold a higher qualification. The appointment will be for 1 year renewable for a maximum of 4. The first year will be spent at The London Hospital, the second year at Oldchurch Hospital, Romford, the third and fourth at 1 of the above by arrangement.

Applications (12 copies), giving the names and addresses of 3 referees, should be received by the undersigned by 15th February, 1957. H. BRIERLEY, House Governor.

LONDON HOSPITAL, Whitechapel, E.1, AND THE NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of SENIOR REGISTRAR in General Medicine. A higher qualification in medicine is required. The appointment will be for 1 year renewable for a maximum of 4. The first 2 years will be spent at The London Hospital and the remainder at the Forest Group based on the Connaught Hospital or in a special department, or on research work.

Applications (12 copies), giving the names and addresses of 3 referees, should be received by the undersigned by 22nd February, 1957. H. BRIERLEY, House Governor.

METROPOLITAN HOSPITAL, Kingsland-road, E.8. (General—146 Beds.) Applications are invited for the pre-registration post of 1 HOUSE SURGEON now vacant.

Applications, stating age, nationality, qualifications, or probable date of qualification and experience with copies of 3 recent testimonials, to the Hospital Secretary as soon as possible.

MILE END HOSPITAL, Bancroft-road, London, E.1. (484 Beds.) HOUSE SURGEON (pre- or post-registration). Post vacant 22nd February, 1957.

Application forms, obtainable from Physician-Superintendent, should be returned by 8th February, with copies of not more than 3 testimonials.

MILE END HOSPITAL, Bancroft-road, London, E.1. (484 Beds.) HOUSE PHYSICIAN (pre- or post-registration). Post vacant 8th March, 1957.

Application forms, obtainable from Physician-Superintendent, should be returned by 15th February with copies of not more than 3 testimonials.

NELSON HOSPITAL, Kingston-road, Merton, S.W.20. HOUSE SURGEON (resident). Approved for Pre-registration Service. Vacant 17th February.

Applications, stating age, qualifications, &c., with names and addresses of 2 referees, to the Secretary at above address.

NATIONAL HEART HOSPITAL, Maids Moreton, Buck-INGHAM. (Country Branch of the National Heart Hospital.) Applications are invited for the post of RESIDENT MEDICAL OFFICER at the Hospital's Country Branch. The appointment is for a period of 6 months from 1st April, 1957, but may be renewed for a further period not exceeding 6 months. The status of the post is that of a Senior House Officer and the salary is in accordance with the terms and conditions of service of hospital medical staff. The holder will be expected to attend on 1 day weekly at the Hospital in Westmoreland-street.

Applications, with copies of 3 recent testimonials, should be sent to me at Westmoreland-street, London, W.1, not later than 16th February, 1957.

ROBERT G. E. WHITNEY, Secretary to the Board.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. Applications are invited for the full-time appointment of Locum MEDICAL REGISTRAR (non-resident) at Maida Vale Hospital for Nervous Diseases, London, W.9, which will become vacant on 1st March, 1957. Grading as Senior Registrar. The appointment will be for a minimum period of 3 months, preference will be given to a candidate holding a higher degree.

Applications, with copies of 3 testimonials, to be sent to the Secretary at Maida Vale Hospital, not later than 11th February, 1957.

PLAISTOW HOSPITAL, Samson-street, London, E.13. (185 Beds.) Applications are invited for the appointment of RESIDENT HOUSE OFFICER (post-registration or pre-registration second post) for 6 months commencing 1st April, in the Chest Unit and Infectious Diseases Unit. Some experience in diseases of the chest desirable. The position offers good opportunities for experience in general medicine.

Applications, with copies of recent testimonials, to Hospital Secretary by 6th February.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, E.15. SENIOR OBSTETRIC HOUSE SURGEON (Male or Female), Senior House Officer grade, 6 months commencing 1st April, 1957. Post recognised for M.R.C.O.G.

Applications, with the names of 3 referees, to Group Secretary, West Ham Group Hospital Management Committee, Stratford, E.15, by 15th February, 1957.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, E.15. OBSTETRIC HOUSE SURGEON (Male or Female), House Officer third post, 6 months commencing 1st April, 1957. Successful candidate may be eligible for appointment as Senior Obstetric House Surgeon (Senior House Officer grade) for the following 6 months. Post recognised for M.R.C.O.G.

Applications, with the names of 3 referees, to Hospital Secretary by 15th February, 1957.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, E.15. HOUSE SURGEON (Male or Female), House Officer third post, 6 months commencing 16th March, 1957. Post recognised for F.R.C.S.

Applications, with the names of 3 referees, to Hospital Secretary by 15th February, 1957.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford, E.15. PÆDIATRIC HOUSE PHYSICIAN (Male or Female), House Officer third post. Duties will include some work in related Departments (e.g., Diabetic Clinic &c.). 6-month appointment, commencing 17th March, 1957. Post recognised for D.C.H.

Applications, with the names of 3 referees, to Hospital Secretary by 15th February, 1957.

ROYAL FREE HOSPITAL. Applications are invited from registered medical practitioners for the post of SENIOR CASUALTY OFFICER at the Royal Free Hospital, Gray's Inn-road, W.C.1. The appointment is full-time, resident, for 6 months; duties to commence 1st April, 1957. Salary and conditions of service in accordance with the scale laid down by the Ministry of Health for Senior House Officers.

Application forms may be obtained from the Hospital Secretary, Royal Free Hospital, Gray's Inn-road, W.C.1, to whom they should be returned not later than 28th February, 1957.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, BROCKLEY HILL, STANMORE, MIDDLESEX. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER for a period of 6 months; duties to commence 20th March, 1957.

Applications to be received by 16th February. Forms of application can be obtained from the House Governor at 234, Great Portland-street, London, W.1.

SOUTH EAST REGIONAL THORACIC SURGERY UNIT. (50 Beds.) BROOK GENERAL HOSPITAL, Shooters Hill-road, S.E.18. SENIOR HOUSE OFFICER, vacant 15th February. Recognised for F.R.C.S. 6 months appointment and may then be renewed for a further period. The Unit treats all types of chest diseases and offers opportunity for comprehensive training in thoracic surgery.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

SOUTH LODGE HOSPITAL, World's End-lane, N.21. RESIDENT SENIOR HOUSE OFFICER required. Infectious diseases and other general duties. Vacant now.

Applications, with names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee, Chase Farm Hospital, Enfield, Middx.

ST. CHARLES' HOSPITAL, Ladbroke-grove, W.10. (581 Beds.) Applications are invited to fill the post of SENIOR HOUSE OFFICER (orthopædics, ophthalmology, plastics, E.N.T., &c.).

Applications, stating age, qualifications, experience, &c., together with names and addresses of 2 referees, to be forwarded to Hospital Secretary immediately.

ST. JAMES' HOSPITAL, Balham, S.W.12. Senior House OFFICER (general surgery and genito-urinary). Post recognised for F.R.C.S. Vacant 1st April.

Applications, stating age, experience, qualifications and names of 2 referees, to Group Secretary, Wandsworth Hospital Group, at above address by 16th February. (0141.)

ST. THOMAS'S HOSPITAL, London, S.E.1. Registrar to the Cardiac Department for a period of 1 year in the first instance.

Applications, naming 2 referees, to the Clerk of the Governors by 8th February, 1957.

ST. THOMAS'S HOSPITAL, London, S.E.1. Registrar to the Chest Department for a period of 1 year in the first instance.

Applications, naming 2 referees, to the Clerk of the Governors by 8th February, 1957.

ST. THOMAS'S HOSPITAL, London, S.E.1. Registrar to the Skin Department for a period of 1 year in the first instance.

Applications, naming 2 referees, to the Clerk of the Governors by 8th February, 1957.

ST. MARY'S HOSPITAL, Paddington, W.2. Applications are invited from suitably qualified Male candidates for the post of Whole-time REGISTRAR in the Venereal Diseases Department. The appointment, which is eminently suitable for persons reading for a higher qualification, is for a first period of 12 months as from a date to be arranged, the holder being eligible for re-election.

Applications, stating nationality, date of birth, qualifications, details of experience, together with dates and National Health Service gradings of previous and present appointments and names and addresses of 3 referees, should reach, ALAN POWDITCH, House Governor, not later than 12th February, 1957.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There is a vacancy for an ORTHODONTIC REGISTRAR to the Dental Department (grade—Registrar). The appointment is full-time and non-resident.

Further particulars and form of application, which must be returned not later than Monday, 18th February, 1957, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy on 14th May, 1957, for a RESIDENT ANÆSTHETIST (Registrar grade) for duty primarily at the Country Branch Hospital, Tadworth, Surrey.

Full particulars and form of application, which must be returned not later than 4th March, 1957, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be vacancies for the following Senior House Officers:—

1 HOUSE PHYSICIAN, on 15th May, 1957.

1 HOUSE SURGEON to the Orthopædic and Plastic Departments, on 15th May, 1957.

Further particulars and form of application, which must be returned not later than 4th March, 1957, are obtainable from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

WESTMINSTER HOSPITAL, St. John's-gardens, S.W.1. Applications invited for post of REGISTRAR (part-time for 6 half-days each week) to Ophthalmic Department for 1 year in first instance from 22nd February. Candidates should have held at least 2 general medical or surgical house appointments.

Applications (6 copies), with names of 2 referees, to House Governor by 12th February.

WHIPPS CROSS HOSPITAL, London, E.11. Applications are invited from fully registered medical practitioners for the post of HOUSE SURGEON (Orthopædic Department). Post recognised for the F.R.C.S. and vacant mid-March.

Application forms from the Hospital Secretary to be returned by 11th February, 1957.

WHIPPS CROSS HOSPITAL, London, E.11. Applications are invited for the following posts which fall vacant on 26th March, 1957:—

HOUSE PHYSICIAN (post- or pre-registration), General Medicine.

HOUSE PHYSICIAN (pre-registration), General Medicine.

Application forms (please state which post applied for) from the Hospital Secretary, to be returned by 11th February, 1957.

WILLESDEN GENERAL HOSPITAL, Harlesden-road, N.W.10. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. MEDICAL REGISTRAR required at above Hospital.

Application forms from, and returnable to, Group Secretary, Central Middlesex Group Hospital Management Committee, Acton-lane, N.W.10, by 9th February, 1957.

ACCRINGTON. VICTORIA HOSPITAL. (114 Beds.) BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required for 8th February, 1957. Post recognised for F.R.C.S. and approved for pre-registration purposes.

Applications to Group Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn, Lancs.

ARLESEY, BEDFORDSHIRE. THREE COUNTIES HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER at the above Mental Hospital of 1300 Beds. Opportunities available for further study.

Applications, with 2 recent testimonials, should be addressed to the Medical Superintendent as soon as possible.

ASHFORD HOSPITAL, Ashford, Middlesex. Staines GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE SURGEON (Male) for general surgical duties. 6 months appointment vacant 5th March, 1957. Preference given to pre-registration candidates.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital.

BIDEFORD AND DISTRICT HOSPITAL, North Devon. (51 Beds.) SENIOR HOUSE OFFICER required for medical and surgical duties. Married accommodation available in the Hospital.

Applications, stating age, qualifications and experience, and naming 2 referees, to Group Secretary, North Devon Hospital Management Committee, 19, Alexandra-road, Barnstaple.

BARROW AND FURNESS HOSPITAL MANAGEMENT COMMITTEE. OBSTETRIC AND GYNÆCOLOGY DEPARTMENT. Applications are invited for the resident post of SENIOR HOUSE OFFICER at the Risedale Maternity Hospital, Barrow-in-Furness. Post available from 1st April, 1957. Hospital approved for D.Obst.R.C.O.G.

Applications to the Group Secretary, 105, Abbey-road, Barrow-in-Furness.

BARROW AND FURNESS HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident or non-resident post of REGISTRAR in Anæsthetics in the Barrow and Furness Group of hospitals, based at the North Lonsdale Hospital, Barrow-in-Furness. Hospital recognised for D.A.

Applications, giving age, details of experience, and names of 3 referees, to Group Secretary, 105, Abbey-road, Barrow-in-Furness.

BARNSTAPLE. NORTH DEVON INFIRMARY. (105 Beds.) HOUSE SURGEON required. Recognised pre-registration appointment; the post can be taken up immediately.

Applications to Group Secretary, North Devon Hospital Management Committee, 19, Alexandra-road, Barnstaple.

BANGOR. CAERNARVON AND ANGLESEY GENERAL HOSPITAL. Applications are invited for the post of HOUSE SURGEON at the above Hospital. (Recognised for F.R.C.S.) The appointment is for a period of 6 months. Salary and conditions of service in accordance with those approved by the Ministry of Health.

Applications, stating age, qualifications and experience, together with the names and addresses of 2 referees, to be forwarded to the Group Secretary, Caernarvon and Anglesey Hospital Management Committee, Plas Gwyn, Ffriddoedd-road, Bangor, immediately.

BECKENHAM HOSPITAL, Kent. (100 Beds.) House SURGEON required at above Hospital. Recognised for F.R.C.S. Pre-registration post.

Apply, stating age, nationality, qualifications, and experience, and naming 3 referees, to Administrative Officer.

BEDFORD (near). BROMHAM HOSPITAL. (434 Beds for Mental Defectives and 60 at Annexe near Sandy.) JUNIOR HOSPITAL MEDICAL OFFICER (psychiatry) required. Post may be non-resident and for 4 years in the first instance. Hospital may be visited by direct appointment with the Psychiatrist-Superintendent (Phone: Oakley 295).

Application forms obtainable from, and returnable to, Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford, by 23rd February, 1957.

BEDFORD GENERAL HOSPITAL. (439 Beds.) House SURGEON required. Pre- or post-registration. Recognised for F.R.C.S. Post offers exceptional opportunities for general experience in busy acute Surgical Units.

Inquiries and applications, with copies of 2 recent testimonials, to Group Secretary, 3, Kimbolton-road, Bedford.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 acute beds.) ORTHOPÆDIC HOUSE SURGEON (first, second, or third post), vacant end February. Offers good opportunity for general experience in busy acute general hospital. Approved pre-registration post. Fully qualified practitioners may apply. Recognised for F.R.C.S. Married quarters may be available.

Apply Group Secretary.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. ASSISTANT PATHOLOGIST (Senior House Officer grade) required in Area Laboratory with attendance at Branch Laboratory, Driffield. Offers experience all branches of pathology. Salary £745.

Detailed applications to Group Secretary.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 acute beds.) HOUSE OFFICER in Obstetrics and Gynæcology. Pre-registration post. House Officer or Senior House Officer grading according to experience. Vacant shortly. Hospital has Maternity Unit of 22 Beds and Gynæcological Annexe of 18 Beds. Fully qualified practitioners may apply. Married quarters may be available.

Detailed applications to Group Secretary.

BISHOP AUCKLAND. THE GENERAL HOSPITAL. HOUSE OFFICER (obstetrics and gynæcology). Applications invited from registered or pre-registration practitioners. Vacant 1st March, 1957. Recognised for D.Obst.R.C.O.G. Departmental beds 69.

Apply, naming 2 referees, to Group Secretary, South West Durham Hospital Management Committee, at above address, as soon as possible.

BIRMINGHAM ACCIDENT HOSPITAL. (215 Beds.) Locum REGISTRAR in Anæsthetics, early February for period of 4 months. Previous experience essential. Ample opportunity for studying.

Apply, with 3 testimonials, to Secretary, Birmingham (Selly Oak) Hospital Management Committee, Oak Tree-lane, Birmingham, 29.

BIRMINGHAM. THE UNITED BIRMINGHAM HOS-PITALS. Applications are invited for the appointment of RESIDENT CLINICAL PATHOLOGIST (Senior House Officer grade) at the Queen Elizabeth Hospital, Birmingham. There are 4 residents attached to the Department of Clinical Pathology. In addition to affording general experience in hæmatology, bacteriology and some biochemistry, the appointment can provide opportunities for those studying for higher qualifications in medicine. The appointment is tenable for 1 year.

Application forms should be obtained from the Secretary to the Board of Governors, United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15, and should be returned to him as soon as possible.

BIRMINGHAM. THE UNITED BIRMINGHAM HOS-PITALS AND THE BIRMINGHAM REGIONAL HOSPITAL BOARD. Applications are invited for the joint appointment of SENIOR REGISTRAR in Radiotherapy (non-resident) on the basis of 5½ sessions per week in the United Hospitals and 5½ sessions with the Birmingham Regional Hospital Board (duties at Dudley Road Hospital, Birmingham, in first instance). Candidates should possess the D.M.R.T. or a higher qualification in medicine or surgery.

Forms of application from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15, to be returned by 16th February, 1957.

BIRMINGHAM. THE UNITED BIRMINGHAM HOS-PITALS. THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. HOUSE OFFICER (medical) required for the Professorial Unit for 6 months from 7th April, 1957.

Forms of application may be obtained from the House Governor and should be returned not later than 16th February, 1957. G. A. PHALP, Secretary to the Board of Governors.

BIRMINGHAM. THE UNITED BIRMINGHAM HOS-PITALS. Applications are invited for the post of SENIOR PSYCHIATRIC REGISTRAR (Senior Registrar grade) to the United Birmingham Hospitals. The appointment, tenable at the Queen Elizabeth and Midland Nerve Hospitals, will be for 1 year in the first instance, subject to annual review. The successful candidate may subsequently be required to spend not more than 2 years in a selected Hospital of the Birmingham Regional Hospital Board, in accordance with an arrangement for the interchange of Registrars agreed between the 2 Boards. Candidates should hold the D.P.M. and preferably M.R.C.P. Furnished flat available.

Application forms to be obtained from the Secretary, The United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15, and should be returned by 16th February, 1957.

BIRMINGHAM, 9. LITTLE BROMWICH GENERAL HOSPITAL. RESIDENT MEDICAL OFFICER in Infectious Diseases. Senior House Officer grade. Vacant 1st March, 1957. Hospital serves a wide area and gives opportunities for the study of infectious diseases. Part of the Hospital is being developed as a General Hospital, where further experience can be gained.

Apply Physician-Superintendent, with 2 testimonials.

BIRMINGHAM (near). MARSTON GREEN MATER-NITY HOSPITAL, Berwicks-lane, MARSTON GREEN, near BIRMINGHAM. RESIDENT SENIOR HOUSE OFFICER in Pædiatrics required for either 1st April, or 1st May, 1957, for 6 months or 1 year (the latter to be recognised for D.C.H.). Duties in Premature Baby Unit (12 Cots) in Neo-natal Department at above Hospital (121 Beds). Hospital affiliated to the University of Birmingham for the teaching of students and in Neo-natal and Children's Departments at neighbouring hospitals. Previous pædiatric or obstetric experience desirable.

Detailed applications to Group Secretary, Dudley Road Hospital, Birmingham, 18, by 20th February, 1957.

BIRMINGHAM (near). THE MIDLAND CENTRE FOR NEUROSURGERY, Holly-lane, SMETHWICK, near BIRMINGHAM. (75 Beds.) SENIOR HOUSE OFFICER (resident). Appointment for 1 year (renewable) tenable in medical neurology and neurosurgery.

Applications, with names of 2 referees, to the Group Secretary, West Bromwich and District Hospitals Management Committee.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(1) **Birmingham (Selly Oak) Group, Oak Tree-lane, Birmingham, 29**

REGISTRAR (pædiatric) for Sorrento Maternity Hospital and Premature Baby Unit (106 Beds), vacant 13th May. Hospital affiliated to Birmingham University for training of Medical Students. Duties at other hospitals including 50 pædiatric beds at Little Bromwich General Hospital and children's outpatient sessions. Experience children's diseases essential. Higher qualification an advantage.

(2) **Coventry No. 20 Group Hospital Management Committee, Stoney Stanton-road, Coventry**

REGISTRAR (orthopædic and general surgery) for Manor Hospital, Nuneaton (125 Beds). Recognised F.R.C.S. Experience specialty essential. Resident. Married accommodation available.

Application forms from Group Secretaries to be returned by 11th February, 1957.

BIRMINGHAM REGIONAL HOSPITAL BOARD. Whole-time SENIOR REGISTRAR in Ophthalmology. Duties at North Staffordshire Royal Infirmary (455 Beds). Higher qualification/wide experience specialty essential. Resident or non-resident (3 miles radius of Hospital). Successful candidate may subsequently be required to spend not more than 2 years in a selected hospital of the United Birmingham Hospitals in accordance with the arrangements for the interchange of Registrars agreed between the 2 Boards.

Application forms from Secretary, 10, Augustus-road, Birmingham, 15, by 18th February, 1957. Candidates may visit Hospital.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road. (494 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of HOUSE PHYSICIAN. The appointment, which becomes vacant on 11th March, 1957, is recognised for pre-registration purposes.

Applications to the Hospital Secretary.

BRADFORD, 1. ROYAL EYE AND EAR HOSPITAL. JUNIOR HOUSE SURGEON (ophthalmology). Recognised for D.O.M.S. and F.R.C.S.

Applications, stating age, nationality, qualifications, and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. SENIOR CASUALTY OFFICER (Junior Hospital Medical Officer), non-resident, required immediately at the above, Hospital. Recognised for F.R.C.S.

Applications as locum or permanent post, stating usual particulars and the names of 2 referees, to the Administrative Officer.

BRISTOL. COSSHAM/FRENCHAY HOSPITAL MAN-AGEMENT COMMITTEE. FRENCHAY HOSPITAL. (542 staffed beds—expanding.) SENIOR HOUSE OFFICER (Regional Department of Neurosurgery). Vacancy occurs end of March for the above post, tenable for 6–12 months. The post offers useful surgical experience and the opportunity of gaining a working knowledge of neurological diagnosis. Recognised for F.R.C.S.

Applications to the Secretary, Frenchay Hospital, quoting "N.S.F." 2 referees required.

BRISTOL. COSSHAM/FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. FRENCHAY HOSPITAL. (542 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (medical). The appointment, which will be for 1 year in the first instance, is on the terms and conditions of service for hospital medical staff and is at a salary of £745, less a deduction of £150 p.a. in respect of unmarried accommodation provided at the Hospital. The candidate appointed will have general supervision under the Consultant staff of the 62 beds for general medicine and will be attached as a clinical assistant for occasional duties which may be required in the Regional Departments of Neuro-surgery, Thoracic Surgery, and Plastic Surgery at the Hospital. As the Senior Resident Medical Officer he will be in charge of the " House " and his duties will include pre-employment medical examinations of staff appointed by the Management Committee. It is customary for the resident nursing staff to be invited to register on the patients' panel of the Senior Resident Medical Officer, who is entitled to retain the appropriate fees receivable.

Applications, containing details of qualifications and experience, together with the names of 2 referees, should be forwarded to the Group Secretary, Frenchay Hospital, Bristol, not later than 13th February, 1957.

BRISTOL. COSSHAM/FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER in Pathology required 1st April, 1957, at Frenchay Hospital (542 Beds—General Medicine, General Surgery, and Thoracic, Neuro-surgical, and Plastic Units for the South West). Post may be resident or non-resident but residence essential when on call. It provides training in all branches of clinical pathology and Laboratory is recognised for Diploma in Pathology. Some duties in connection with the Regional Blood Transfusion Service.

Detailed applications, quoting names of 2 referees, should reach the Group Secretary, Frenchay Hospital, Bristol, by 9th February, 1957.

BRISTOL. SOUTHMEAD GENERAL HOSPITAL GROUP MANAGEMENT COMMITTEE. Required, at Snowdon Road Hospital (300 Beds—chronic sick, general medical and dermatology cases), SENIOR HOUSE OFFICER (medical) for 6 or 12 months, commencing 1st April, 1957.

Applications to be made to the Group Secretary, Southmead Hospital, Bristol, not later than 16th February, 1957.

BROXBURN, WEST LOTHIAN. BANGOUR GENERAL HOSPITAL. (15 miles from Edinburgh.) Applications are invited for the post of CASUALTY OFFICER, Bangour General Hospital, Broxburn. Vacant 1st March, 1957. Salary and conditions of service in accordance with regulations.

Applications to Group Secretary and Treasurer, Board of Management, Bangour Hospital, Broxburn, West Lothian.

BROXBURN, WEST LOTHIAN. BANGOUR GENERAL HOSPITAL. (15 miles from Edinburgh.) Applications are invited for the post of HOUSE OFFICER in the General Surgical Unit of Bangour General Hospital. Vacant 15th March, 1957. Pre-registration post. Salary and conditions of service in accordance with regulations.

Applications to Group Secretary and Treasurer, Board of Management, Bangour Hospital, Broxburn, West Lothian.

BLACKBURN. ROYAL INFIRMARY. (262 general beds.) BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER or SENIOR HOUSE OFFICER (casualty and orthopædics) required 28th February, 1957. Post recognised for F.R.C.S. Junior Hospital Medical Officer post can be for any period up to 4 years, and a starting salary above the minimum of the scale may be approved on account of special experience or qualifications.

Apply to Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn, Lancs.

BURTON UPON TRENT. THE GENERAL HOSPITAL. Pre-registration HOUSE OFFICER (general surgery) required at the above Hospital which is recognised for the F.R.C.S.

Applications to Group Secretary as soon as possible.

BUXTON. DEVONSHIRE ROYAL HOSPITAL. (252 Beds.) Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER. This Hospital is a large Special Hospital for the treatment and rehabilitation of all types of locomotor disorders. Duties are mainly medical and include work in the long-stay unit of the Manchester University Rheumatism Research Centre. The Hospital is recognised under the regulations for the Diploma in Physical Medicine, Part 2, and the post also offers good medical experience.

Applications, stating age, experience and qualifications, together with copies of 2 testimonials, to be addressed to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (277 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (casualty) which becomes vacant at the end of March, 1957. Salary £745 p.a. Recognised for the F.R.C.S.

Applications to be sent to the Hospital Secretary at the above Hospital, together with copies of 3 recent testimonials.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (277 Beds.) E.N.T. AND EYE DEPARTMENTS. SENIOR HOUSE OFFICER. Salary £745 p.a. Post vacant at the end of March, 1957. Approved for F.R.C.S. and special diplomas.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (277 Beds.) The post of PÆDIATRIC HOUSE PHYSICIAN, recognised for D.C.H., includes work in the Ward and Outpatient Department and also provides experience in the care of the newborn. Opportunities exist for the study of preventive medicine among children and child guidance work. Post vacant early in March, 1957. National Health Service salary and conditions.

Applications, together with 2 testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (277 Beds.) The post of SENIOR HOUSE PHYSICIAN becomes vacant as from the middle of February, 1957. Salary £745 p.a., with National Health Service conditions.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (277 Beds.) The post of GENERAL SURGICAL AND UROLOGICAL HOUSE SURGEON (pre-registration or third post), which is recognised for the F.R.C.S., becomes vacant at the end of February, 1957. National Health Service salary and conditions.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CARDIFF (near). CAERPHILLY AND DISTRICT MINERS' HOSPITAL. (226 acute general beds.) Applications are invited for posts of HOUSE OFFICER (obstetrics and gynæcology) and HOUSE SURGEONS (2 appointments), vacant on 1st February. Preference given to pre-registration candidates. The Hospital is recognised by the Royal College of Surgeons and an application for recognition has also been made to the Royal College of Obstetricians and Gynæcologists. 6 miles from the teaching Hospital at Cardiff.

Apply to Group Secretary, address as above.

CARDIFF. GLAN ELY HOSPITAL, Fairwater, Cardiff. SENIOR HOUSE OFFICER required at above Hospital.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARDIFF. THE UNITED CARDIFF HOSPITALS. Applications are invited for the appointment of REGISTRAR in Surgery to work mainly at Llandough Hospital, Penarth. Non-resident post, to commence mid-April.

Application forms are available from the Secretary to the Board at the Cardiff Royal Infirmary, Newport-road, Cardiff, and should be returned within 14 days of the appearance of this advertisement.

CARLISLE. GARLANDS HOSPITAL. (1060 Beds.) GARLANDS HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER at the above Mental Hospital. Salary £745 p.a. Flat is available for which a deduction will be made. Appointment is subject to the National Health Service superannuation regulations and to the conditions and terms of service laid down by the Minister of Health.

Applications, stating age, qualifications and experience and the names of 2 referees, should be sent to the Medical Superintendent as soon as possible.

CREWE AND DISTRICT MEMORIAL HOSPITAL. (108 Beds—Acute, and continuation 32 Beds.) SOUTH CHESHIRE HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (surgical) and Pre-registration HOUSE OFFICER (surgical) required. (Approved for F.R.C.S.) Salary and conditions in accordance with Whitley Council scale.

Applications, stating age, qualifications and experience, together with names of 3 referees, to Group Secretary, South Cheshire Hospital Management Committee, Barony Hospital, Nantwich, Cheshire.

CHELMSFORD AND ESSEX HOSPITAL. Applications are invited for the resident post of CASUALTY OFFICER (Senior House Officer). It is recognised for the F.R.C.S. and offers excellent experience in the treatment of fractures and diagnosis of acute medical and surgical emergencies. Opportunity is given for Casualty Officer to follow up his cases in the wards and to obtain operating experience in major theatre under the guidance of the Consultants or the Resident Surgical Officer. Off duty time is generous and the post is one likely to suit both an officer seeking a higher qualification in surgery or one intending General Practice. The vacancy will occur on 2nd March.

Apply Secretary, Chelmsford Hospital Management Committee, Chelmsford and Essex Hospital, Chelmsford.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL (late Botley's Park War Hospital). (430 Beds.) ORTHOPÆDIC HOUSE SURGEON from 12th February, 1957. Senior House Officer or House Officer (Intern) grade. 100 orthopædic beds. Post recognised for F.R.C.S. and Pre-registration Service. Preference given to provisionally registered candidates. Salary in accordance with terms and conditions of National Health Service.

Applications, together with names and addresses of referees, to be sent to the Physician-Superintendent, St. Peter's Hospital, Chertsey, as soon as possible.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL (late Botley's Park War Hospital). (430 Beds.) SENIOR HOUSE OFFICER ANÆSTHETIST required as Locum from 28th February, 1957, to 13th March, 1957, and permanent post to commence 1st April, 1957. Appointment recognised for D.A. and F.F.A.R.C.S. Salary in accordance with terms and conditions of National Health Service.

Applications, together with names and addresses of referees, to be sent to the Physician-Superintendent, St. Peter's Hospital, as soon as possible.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL (late Botley's Park War Hospital). (430 Beds.) RESIDENT HOUSE SURGEON (Senior House Officer or Intern) required for the Gynæcological (30 Beds) and E.N.T. (16 Beds) Departments. Salary in accordance with terms and conditions of National Health Service.

Applications, together with names and addresses of referees, to be sent to the Physician-Superintendent, St. Peter's Hospital, as soon as possible.

CUCKFIELD HOSPITAL, Cuckfield, near Haywards HEATH, SUSSEX. MID-SUSSEX HOSPITAL MANAGEMENT COMMITTEE. SENIOR RESIDENT HOUSE PHYSICIAN. Post vacant 19th February, 1957.

Applications, stating age, qualifications, nationality and experience, with names of 2 referees, to Group Secretary.

CHESTER-LE-STREET. GENERAL HOSPITAL. (204 Beds.) SENIOR HOUSE OFFICER (general surgery). Post vacant 1st February, 1957.

Apply, with names and addresses of 2 referees, to Group Secretary, Dryburn Hospital, Durham.

CHESTERFIELD ROYAL HOSPITAL. House Physician (Senior House Officer grade) required early March at the above Hospital for 54-Bed Medical Unit. Post offers good experience in general medicine, and in paediatrics, diabetics, and dermatology. National salary and conditions applicable.

Further particulars obtainable on request from M. H. BOONE, Secretary, Chesterfield Hospital Management Committee.

CHICHESTER. ST. RICHARD'S HOSPITAL. (400 Beds.) CHICHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, 2 HOUSE SURGEONS for general surgery (pre-registration) for 6 months only in the first instance. Posts vacant now. Posts recognised for F.R.C.S.

Applications, stating age, qualifications and experience, giving names of 2 persons from whom reference may be obtained, should be sent to the Surgeon-Superintendent.

CHICHESTER. ROYAL WEST SUSSEX HOSPITAL. (202 acute beds.) RESIDENT HOUSE SURGEON required for 6 months appointment. National salary scale for first, second, or third posts. Post approved for pre-registration practitioners. Also recognised for F.R.C.S. 7 residents including Resident Surgical Officer and 3 House Surgeons. Vacant 14th February, 1957.

Apply to Senior Administrative Officer.

COLCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for :—

Essex County Hospital, Colchester (185 Beds)

HOUSE OFFICER (surgical). First, second, third or pre-registration post, tenable for 6 months. Recognised for F.R.C.S.

Black Notley Hospital, Braintree (516 Beds)

Posts of HOUSE SURGEON and HOUSE PHYSICIAN The successful applicant will serve 6 months as House Surgeon followed by 6 months as House Physician. First, second, third or pre-registration posts. Surgical post includes duties in general surgical and gynæcological wards. Recognised for F.R.C.S. Medical post includes duties in medical and paediatric wards.

Applications, with copies of 3 testimonials, to Group Secretary, 14, Pope's-lane, Colchester.

COLWYN BAY AND WEST DENBIGHSHIRE HOSPITAL. (60 Beds—acute medical and surgical.) Locum JUNIOR HOSPITAL MEDICAL OFFICER required at the above Hospital for period 9th–26th March, 1957, inclusive.

Applications, with copies of 2 testimonials, to Group Secretary, Clwyd and Deeside Hospital Management Committee, " Rhianfa," Russell-road, Rhyl.

CROYDON. ST. MARY'S MATERNITY HOSPITAL. (33 Beds.) OBSTETRIC HOUSE OFFICER (resident). Post is recognised for D.Obst.R.C.O.G. Preference will be given to those who have held a House Surgeon post. Post commences on 9th March, 1957.

Application forms obtainable from undersigned.

GEORGE A. PAINES, Group Secretary.

General Hospital, London-road, Croydon.

DERBY. CITY HOSPITAL. Senior House Officer (surgical), vacant 1st April, 1957. Recognised for the F.R.C.S.

Apply, stating full details, with copies of 2 recent testimonials, to the Medical Superintendent, City Hospital, Derby.

DERBY. CITY HOSPITAL. (Obstetrical Department.) OBSTETRIC HOUSE SURGEONS (2 vacancies), pre-registration or Senior House Officer. 2 posts are vacant, 1 of which is recognised by the College of Obstetricians for the M.R.C.O.G. and the D.Obst.R.C.O.G. Both posts vacant 1st April, 1957.

Apply, stating age, qualifications and experience, with copies of 2 testimonials, to the Medical Superintendent, City Hospital, Derby.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (396 Beds. Recognised for training for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (orthopædics) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 11th February, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

DOUGLAS. NOBLE'S ISLE OF MAN HOSPITAL. (160 Beds.) Applications are invited for post of HOUSE PHYSICIAN at this busy Hospital, which has been approved for Pre-registration Service. The post, which becomes vacant mid-February, 1957, offers varied experience. 4 residents on the staff. Salary scale £425–£475 according to experience.

Applications, enclosing copies of 2 recent testimonials, to the Secretary, Noble's Hospital, Douglas, Isle of Man.

DOUGLAS. NOBLE'S ISLE OF MAN HOSPITAL. (160 Beds.) Applications are invited for the post of CASUALTY OFFICER/ANÆSTHETIST (House Officer grade post), vacant end of January, 1957. 4 residents on staff. Salary £425–£475–£525 according to experience.

Applications, enclosing copies of 2 recent testimonials, to the Secretary, Noble's Hospital, Douglas, Isle of Man.

DOUGLAS. NOBLE'S ISLE OF MAN HOSPITAL. (160 Beds.) Applications are invited for the post of HOUSE SURGEON. The post is recognised for pre-registration purposes, and becomes vacant in mid-March, 1957. 4 residents on staff. Salary £425–£475 according to experience.

Applications, enclosing copies of 2 recent testimonials, to the Secretary, Noble's Hospital, Douglas, Isle of Man.

DRIFFIELD YORKSHIRE. NORTHFIELD SANATORIUM. (78 Beds.) SENIOR HOUSE PHYSICIAN, vacant now. Offers experience all branches of tuberculosis within the Group, including surgery, M.M.R., and clinics. Time for study. Ex-patients welcome. £150 for full residence.

Applications to Group Secretary, Westwood Hospital, Beverley, Yorkshire.

EAST ANGLIAN REGIONAL HOSPITAL BOARD.

SENIOR REGISTRAR, Department of Child Psychiatry, Ipswich and East Suffolk Hospital. Post provides comprehensive training in child and family psychiatry. Higher qualification desirable. Candidates invited to visit clinic by direct arrangement with Hospital Management Committee Secretary, Ipswich and East Suffolk Hospital (Anglesea Road Wing), Ipswich.

REGISTRAR (mental deficiency and child psychiatry), Little Plumstead (near Norwich) Mental Deficiency Group of hospitals and Child Psychiatry Service. The Group (1000 Beds) which is progressive and the centre for much outpatient work including child psychiatry clinics, is recognised as a training centre for the D.P.M. by the Conjoint Board for 1 year. House or flat available. Candidates invited to visit hospitals by direct arrangement with Medical Superintendent.

Applications, stating age, experience, and the names of 3 referees, to Board's Senior Administrative Medical Officer, 117, Chesterton-road, Cambridge, by 11th February, 1957.

EAST GRINSTEAD. QUEEN VICTORIA HOSPITAL (PLASTIC SURGERY AND JAW INJURIES UNIT.) TUNBRIDGE WELLS GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE SURGEON required, 1st March, 1957. Appointment for 6 months, offering considerable opportunity to gain experience in plastic surgery and jaw injuries work.

Applications, stating age, and the names of 3 referees, to Hospital Secretary.

EDGWARE GENERAL HOSPITAL. (715 Beds.) North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR (whole-time), resident, required in Department of Anæsthesia at above Hospital, vacant 26th February, 1957. Hospital may be visited by direct appointment with Medical Director.

Application forms obtainable from, and returnable to, Group Secretary, Hendon Group Hospital Management Committee, Edgware General Hospital, Edgware, Middlesex, by 12th February, 1957.

EDINBURGH CENTRAL HOSPITALS BOARD OF MANAGEMENT. Applications are invited from registered medical practitioners and pre-registration graduates, for resident appointments for 6 months, commencing 1st April, 1957. National Health Service scale.

Royal Hospital for Sick Children

2 HOUSE PHYSICIANS.

Chalmers Hospital

1 HOUSE SURGEON.

1 HOUSE SURGEON (Gynæcological and Children's Surgical Annexe).

Princess Margaret Rose Hospital

2 HOUSE SURGEONS.

Applications, stating age, qualifications and experience, and names of 2 referees, to be sent within 14 days to Medical Superintendent, 18, Rillbank-terrace, Edinburgh, 9.

EDINBURGH CENTRAL HOSPITALS. Applications are invited from registered medical practitioners for the appointment of ANÆSTHETIST (Junior Hospital Medical Officer grade), commencing 12th February, 1957. Salary scale £775–£1075. National Health Service conditions. Non-resident. Work mainly with children but includes some adult general surgery and gynæcology.

Applications, with full particulars of age, qualifications and experience, and names of 2 referees, to be submitted immediately to Medical Superintendent, Edinburgh Central Hospitals, 18, Rillbank-terrace, Edinburgh, 9.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. RESIDENT HOUSE SURGEON (pre-registration post) vacant, 22nd March, 1957. Duties with General Surgical Unit, doing some genito-urinary work. Post recognised by the Royal College of Surgeons. 6 months appointment.

Applications, with names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee, at Chase Farm Hospital.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. RESIDENT SENIOR HOUSE OFFICER required in the Department of Anæsthesia, vacant 10th March, 1957. 12 months appointment. The post is recognised for the D.A. and F.F.A.R.C.S. and affords a wide range of practical experience and tuition under Consultant supervision.

Applications, giving names and addresses of 2 referees, to the Group Secretary, Enfield Group Hospital Management Committee, at Chase Farm Hospital.

EPSOM, SURREY. WEST PARK HOSPITAL. Junior HOSPITAL MEDICAL OFFICER required. Salary scale £775–£1075. Subject to Whitley Council conditions and National Health Service superannuation regulations. West Park is a psychiatric hospital with 2400 Beds, where all modern treatments are practised. A good knowledge of general medicine is essential. Applicants may be of either sex, and single quarters are available.

Applications, including the names of 3 referees, should be sent to the Physician-Superintendent within 10 days.

EXETER. ROYAL DEVON AND EXETER HOSPITAL. Applications are invited from registered medical practitioner for the appointment of SENIOR HOUSE OFFICER (anæsthetics), resident or non-resident, vacant 23rd February, 1957. The post is recognised for the F.F.A.R.C.S. examination.

Applications, with copies of 2 recent testimonials, to the Hospital Secretary by 16th February, 1957.

GREAT YARMOUTH AND GORLESTON GENERAL HOSPITAL, DENE SIDE, GREAT YARMOUTH. HOUSE SURGEONS (2). Male or Female, required immediately. These are pre-registration posts, salary £425, £475 or £525 p.a. according to experience, less deduction for board-residence. Membership of a Medical Defence Society is a condition of appointment.

Applications, stating age, qualifications and experience with names of 2 referees, to Hospital Secretary.

GUILDFORD. ROYAL SURREY COUNTY HOSPITAL. (233 Beds.) RESIDENT HOUSE SURGEON required for general surgery. Post is vacant on 25th February and tenable for 6 months. It is approved for pre-registration practitioners and recognised for the F.R.C.S. examination.

Applications, with copies of 3 testimonials, should be sent to the Hospital Secretary as soon as possible.

HAREFIELD HOSPITAL, Harefield, Middlesex. North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners for the post of SURGICAL REGISTRAR (B1) for general beds at above Hospital. Candidates must have had previous surgical experience and preference will be given to those with a higher surgical qualification. The appointment will be subject to the Ministry of Health's terms and conditions of service.

Application forms obtainable from, and returnable to, the Group Secretary, Harefield and Northwood Group Hospital Management Committee, Mount Vernon Hospital, Northwood, Middlesex, by 16th February, 1957.

HAREFIELD HOSPITAL, Harefield, Middlesex. North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SENIOR MEDICAL REGISTRAR required at above Hospital. Applicants should hold a higher qualification in medicine and should have experience in general medicine and diseases of children as well as of the diagnosis and modern methods of treatment of tuberculosis. The post will normally be held for about 2 years and the successful candidate will then be given the opportunity of serving for a further 2 years, approximately, as a Senior Registrar at Uxbridge Chest Clinic, 259, High-street, Uxbridge, Middlesex. Hospital and Clinic may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, Harefield and Northwood Group Hospital Management Committee, Mount Vernon Hospital, Northwood, Middlesex, by 16th February, 1957.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) HOUSE SURGEON required, pre-registration post, vacant 11th March, 1957.

Apply, with testimonials, to Hospital Administrator, as soon as possible.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) RESIDENT CASUALTY OFFICER (Senior House Officer grade) with attachment to Pædiatrician and Ophthalmic Consultant. Salary £745 p.a., less £150 p.a. residential emoluments. Recognised under F.R.C.S. regulations. Appointment to commence immediately.

Apply, with full details and references, to Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

HEXHAM GENERAL HOSPITAL. (309 Beds.) Resident HOUSE SURGEON (orthopædics). Large Orthopædic Unit providing excellent experience in this branch of surgery. Pre-registration post but applications from registered practitioners will be considered. Hospital recognised by R.C.S.

Applications, with names of 2 referees, as early as possible to Group Secretary, General Hospital, Hexham, Northumberland.

W. STOKELL, Group Secretary.

HITCHIN, HERTFORDSHIRE. LISTER HOSPITAL. Applications are invited for CASUALTY OFFICER (resident) for duty with Accident Service and as Orthopædic House Surgeon. Recognised as pre-registration post and for F.R.C.S., and becomes vacant on 13th February, 1957.

Applications, stating age, nationality, qualifications, and experience, together with copies of 3 recent testimonials, to be sent to the Medical Administrator, Lister Hospital, as soon as possible.

HORNCHURCH. ST. GEORGE'S HOSPITAL. Junior HOSPITAL MEDICAL OFFICER (resident) required immediately at this Hospital which accommodates 404 chronic sick patients. The post offers excellent geriatric experience.

Applications should be forwarded to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford, as soon as possible.

HULL. KINGSTON GENERAL HOSPITAL. (419 Beds.) HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON (pre-registration post), resident, and tenable for 6 months. This post includes gynæcology, E.N.T., and general surgery. Vacant early February.

Applications, with 2 recent testimonials, to the Hospital Secretary.

HULL. VICTORIA HOSPITAL FOR SICK CHILDREN, Park-street. HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. 2 HOUSE SURGEONS required at the above Hospital; 1 post vacant 17th February, 1 post vacant 28th February. Registration or pre-registration posts. 6-monthly term in each case; both posts recognised for the D.C.H. qualification. Salary according to national scale.

Replies, with testimonials, should be sent to the Hospital Secretary.

KINGSTON HOSPITAL, Wolverton-avenue, Kingston UPON THAMES. KINGSTON GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from suitably qualified medical officers for the post of SENIOR HOUSE OFFICER (gynæcology) which is now available. This post is recognised for M.R.C.O.G. purposes.

Applications, stating age, qualifications, and experience, with 2 recent testimonials, should reach the Physician-Superintendent of the Hospital as soon as possible.

KIRKCALDY. VICTORIA HOSPITAL. House Physician required for above Hospital. 65 acute medical beds and 48 aged sick beds. Grading according to experience. The post qualifies for pre-registration.

Apply, with copies of testimonials or 2 references, to the Medical Superintendent, East Fife Hospitals Board of Management, 243A, High-street, Kirkcaldy.

KNAPHILL, WOKING, SURREY. BROOKWOOD HOS-PITAL. Applications are invited for the post of Locum Tenens JUNIOR HOSPITAL MEDICAL OFFICER. The Hospital which is for the treatment of mental and nervous diseases undertakes all modern methods of treatment and accommodates 1800 patients. Salary and conditions of service are as laid down by the appropriate Whitley Medical Committee—viz. £17 10s. per week. The appointment is resident and a charge of £170 p.a. will be made for full residential emoluments.

Applications, stating age, qualifications and experience, together with the names of 3 referees, should be sent to the Physician-Superintendent, within 14 days of the appearance of this advertisement.

LANCASTER MOOR HOSPITAL, Lancaster. (Regional MENTAL HOSPITAL.) Applications invited for post of SENIOR HOUSE OFFICER (resident). Board and residence for unmarried applicant available for which a charge of £150 p.a. is made. Hospital, which has 2700 Beds, serves North Lancashire, Westmorland, and parts of the West Riding of Yorkshire, and has an admission-rate of almost 800 of which 80% are voluntary. All modern forms of treatment are carried out. Facilities afforded to attend D.P.M. Course. Salary according to national terms and conditions of service.

Apply Medical Superintendent.

LEEDS (near). MENSTON (MENTAL) HOSPITAL. Applications invited for whole-time appointments (*a*) SENIOR HOUSE OFFICER (*b*) JUNIOR HOSPITAL MEDICAL OFFICER. Facilities available for training in all branches of Psychiatry in conjunction with Department of Psychiatry, Leeds University. Salaries in accordance with terms and conditions of service of hospital medical and dental staffs. Residential accommodation for single persons. No house or flat available.

Applications to Physician-Superintendent, stating age, civil state, qualifications, experience, and names and addresses of 2 referees.

LEEDS (near). MENSTON (MENTAL) HOSPITAL. Locum Tenens JUNIOR HOSPITAL MEDICAL OFFICER required to commence duty immediately. Residential accommodation for single person.

Applications to Physician-Superintendent, stating age, civil state, qualifications, experience, and names and addresses of 2 referees.

LEEDS REGIONAL HOSPITAL BOARD. Registrar vacancies.

Anæsthetics

Halifax Group (approximately 290 Beds in the Surgical Specialties). Resident.

General Surgery

Dewsbury, Batley and Mirfield Group (120 general surgical beds) may include some duties in the Casualty Department. Resident.

Infectious Diseases

Castle Hill Hospital, Cottingham (167 Infectious Diseases beds). Resident.

Psychiatry

Storthes Hall Hospital (2750 Beds). If desired, facilities for attendance at Leeds University will be provided if the successful candidate is studying for the D.P.M.

Radiotherapy

Regional Radium Institute, Bradford (50 Beds), preferably resident. Unit provides a complete Radiotherapy Service for approximately 1 million population.

Applications, stating age, qualifications, and details of present and previous appointments and dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 14th February, 1957.

LEEDS REGIONAL HOSPITAL BOARD. Short-term LOCUM TENENS appointments in the Registrar grade are constantly available at hospitals in the area of the Board, particularly in the specialties of anæsthetics, general medicine, general and orthopædic surgery, and psychiatry.

Interested practitioners, suitably experienced, should communicate with the Secretary, Joint Registrars Committee, Park-parade, Harrogate.

LEEDS. THE UNITED LEEDS HOSPITALS. The GENERAL INFIRMARY AT LEEDS. REGISTRAR in Anæsthetics required for duties in the Teaching Hospital Group. Terms and conditions of service for hospital medical staff apply.

Applications, stating age, qualifications, experience with relevant dates, and giving 3 names for reference, should be forwarded to the Sub-Dean, The Medical School, Leeds, 2, not later than 11th February, 1957.

LEEDS. THE UNITED LEEDS HOSPITALS. The GENERAL INFIRMARY AT LEEDS. SENIOR HOUSE OFFICER in E.N.T. Department required for a period of 6 months. Post vacant now. Terms and conditions of service for hospital medical staff apply.

Applications, giving details of age, qualifications, posts held with dates, and 3 names for reference, should be sent to the Secretary of the Board, as soon as possible.

LLANELLY HOSPITAL, Llanelly. Glantawe Hospital MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the resident appointment of JUNIOR HOSPITAL MEDICAL OFFICER in the Medical Unit of the above Hospital.

Applications, stating age, experience and qualifications together with copies of 2 recent testimonials, should be sent to the Hospital Secretary. T. E. JONES, Group Secretary.

LLWYNPIA HOSPITAL, Llwynpia, Rhondda. (190 Beds, including acute medical and chronic sick beds.) HOUSE OFFICER (medical). Person appointed will also undertake duties at the Group Infectious Diseases Hospital when required.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent to the Group Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd.

LINCOLN. BRACEBRIDGE HEATH HOSPITAL. (For Mental Diseases, approximately 1300 Beds.) Applications are invited for the appointment of a Permanent or Locum Tenens JUNIOR HOSPITAL MEDICAL OFFICER (resident or non-resident), Male or Female (married or single). Salary and terms of service as laid down by the Ministry of Health. There is residential accommodation for a single or married officer. There will be scope for learning the use of modern psychiatric methods in the wards. Previous psychiatric experience is not essential. The appointment is subject to the provisions of the National Health Service superannuation regulations.

Applications, with the names of 2 referees, should be forwarded as soon as possible to the Medical Superintendent, Bracebridge Heath Hospital, near Lincoln.

LINCOLN COUNTY HOSPITAL. (200 Beds.) Applications are invited for the pre-registration post of HOUSE SURGEON. The post is tenable for a period of 6 months from 1st February, 1957, and will be followed by a pre-registration post of House Physician.

Applications, giving full particulars, should be addressed to—
R. W. HOWICK, Group Secretary

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE SURGEON. 6 months appointment. Post vacant February, 1957. Salary at the rate of £425–£525 p.a. A deduction at the rate of £125 a year is made for board and lodging, and other services provided.

Applications should be forwarded, as soon as possible, to the Administrative Officer at the Hospital.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. CASUALTY OFFICER (Senior House Officer). Recognised for F.R.C.S. Salary £745 a year, less £150 a year for board and lodging. Post vacant February, 1957.

Applications to the Administrative Officer at the Hospital.

MANCHESTER REGIONAL HOSPITAL BOARD. ROCHDALE INFIRMARY. (109 surgical beds.) RESIDENT SURGICAL OFFICER (Registrar grade) required for this busy surgical hospital which has a large Outpatients Department. Recognised for F.R.C.S.

Apply at once, with details of experience and qualifications, and names of 3 referees, to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale.

MANCHESTER REGIONAL HOSPITAL BOARD. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT REGISTRAR in Obstetrics and Gynæcology. The post is recognised for training for M.R.C.O.G. purposes. The main duties will be at Withington Hospital which takes part in undergraduate teaching. Applicants should have had previous experience in obstetrics and gynæcology.

Applications, stating age, experience and the names of 2 referees, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20, immediately.

MANCHESTER REGIONAL HOSPITAL BOARD. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. WITHINGTON HOSPITAL, MANCHESTER, 20. The Board invites applications for the post of REGISTRAR in Pathology, Group Laboratory, Withington Hospital (1088 Beds). The Laboratory is recognised for the D.Path. examination, and facilities are available for training in all branches of clinical pathology.

Applications, stating age, qualifications, present post, experience, and names of 2 referees, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20, to arrive not later than 16th February, 1957.

MANCHESTER. SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. THE DUCHESS OF YORK HOSPITAL FOR BABIES AND WYTHENSHAWE HOSPITALS. Applications are invited for the post of SENIOR HOUSE OFFICER, vacant 1st April, 1957, with possibility of prior Locum. Joint post of not less than 3 months and preferably 6 months at each Hospital recognised as training for the D.C.H. The Duchess of York Hospital is also attached to the Manchester University Department of Child Health.

Applications to the Group Secretary, Withington Hospital, Manchester, within 7 days of the appearance of this advertisement.

MANCHESTER. SPRINGFIELD HOSPITAL, Crumpsall, MANCHESTER, 8. SPRINGFIELD AND SWINTON HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for an additional appointment of PSYCHIATRIC REGISTRAR at this Mental Hospital of 750 Beds, where modern methods of investigation and treatment are carried out. The admission-rate is high—in the region of 900 per year; in addition, there are outpatient clinics at the Hospital. Facilities will be granted for attendance at the Course for the D.P.M. of the University of Manchester (with the Department of Psychiatry of which this Hospital is associated). Attendance at these lectures is not limited to those intending to take the Manchester examination. Accommodation is available for a single person; permission to live out may be granted. Terms and conditions of the National Health Service apply. Further particulars can be obtained from, and the Hospital may be visited by arrangement with, the Medical Superintendent.

Applications, giving details of age, experience, &c., together with the names of 3 referees, to be sent to the Medical Superintendent as soon as possible.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. PARK HOSPITAL, DAVYHULME. (General Hospital—433 Beds.) SENIOR HOUSE OFFICER required for Group Laboratory. Post vacant early April, 1957, and tenable for 1 year. Duties which alternate with holder of second similar post include routine general pathology and emergency investigations. Laboratory recognised for D.Path. and D.C.P. examinations. Previous experience not essential.

Application forms from Group Secretary.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS, MANCHESTER. Applications are invited for 4 posts of HOUSE OFFICER in Gynæcology. Applicants must have had previous hospital experience in medicine and surgery. The posts are recognised for the purpose of the M.R.C.O.G. examination. The appointments are for 6 months starting 1st April, 1957. Salary in accordance with national scale.

Application forms may be obtained from the undersigned and returned not later than 12th February, 1957.

A. R. WISE, General Superintendent.
Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS, MANCHESTER. Applications are invited for the post of SENIOR HOUSE OFFICER in Obstetrics, vacant 1st April, 1957. Applicants must have had previous hospital experience in general medicine and surgery, and in obstetrics. The post is recognised for the purposes of the M.R.C.O.G. examination. The duties involve clinical responsibility for mothers and babies and supervision of the work of pre-registration House Officers is also included. The appointment is for 12 months. National scale.

Application forms may be obtained from the undersigned and returned not later than 18th February, 1957.

A. R. WISE, General Superintendent.
Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER, 8. CRUMPSALL HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER to the Psychiatric Department at the above General Hospital, vacant 1st April, 1957. This department offers experience in all branches of psychiatric illness, including all modern methods of treatment. Facilities available for candidates taking Diploma in Psychiatric Medicine. Experience not essential.

Applications, with names of 2 referees, by 11th February, 1957, to Group Secretary, North Manchester Hospital Management Committee, Crumpsall Hospital, Manchester, 8.

MARGATE. ROYAL SEA BATHING HOSPITAL. (Surgical Tuberculosis and Orthopædics—242 Beds.) The post of SENIOR HOUSE OFFICER (1 of 2) is largely an orthopædic one, and affords experience in the treatment of tuberculous and non-tuberculous orthopædic conditions. There is also a Genito-urinary Unit of 35 Beds and a small number of Beds for other tuberculous conditions. The post is recognised for the F.R.C.S., and is suitable for someone reading for a higher surgical examination. Salary £745 p.a., less £150 for residential emoluments.

Applications, with copies of testimonials, to Hospital Secretary.

MITCHAM. WILSON HOSPITAL, Cranmer-road, MITCHAM, SURREY. SENIOR HOUSE OFFICER (surgical). Duties mainly in Casualty Department. Post vacant 10th February.

Applications, enclosing copies of recent testimonials and the names of 2 referees, to Group Secretary, St. Helier Hospital, Carshalton, Surrey.

NOTTINGHAM. CITY HOSPITAL. (611 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER at the Department of Thoracic Surgery. Post vacant 24th March, 1957. Salary £745 p.a., less £150 p.a. for residential emoluments. The appointment will be for 1 year.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be submitted immediately to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM. FIRS MATERNITY HOSPITAL. (40 Beds.) Required, RESIDENT SENIOR HOUSE OFFICER (obstetrics). Post vacant 22nd March, 1957. Recognised for D.Obst.R.C.O.G. Previous experience in obstetrics an advantage.

Applications, with copies of 3 testimonials, to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM. HIGHBURY HOSPITAL, Bulwell, NOTTINGHAM. Locum SENIOR HOUSE OFFICER (resident), obstetrics and gynæcology, required for 3rd–17th February, 1957. Maternity Unit of 41 obstetrical beds and 11 gynæcological beds.

Apply Secretary.

NORTHWOOD, MIDDLESEX. MOUNT VERNON HOSPITAL. ANÆSTHETIC REGISTRAR required for the Centre for Plastic Surgery. Duties will consist of routine work in the Centre together with emergency work both in the Centre and in the general hospital. Candidates should be working for, or in possession of, the higher qualifications in anæsthesia.

Application forms obtainable from, and returnable to, the Group Secretary, Harefield and Northwood Group Hospital Management Committee, Mount Vernon Hospital, Northwood, Middlesex, by 16th February, 1957.

OXFORD REGIONAL HOSPITAL BOARD. Registrar in Obstetrics and Gynæcology in the hospitals of the Aylesbury area, vacant 1st April. It is hoped that this post may be interchangeable with the Departments of Obstetrics and Gynæcology, United Oxford Hospitals, after the first year. The appointment is for 1 year, eligible for extension to a second year.

Applications, on forms obtainable from the Secretary, Registrar Committee, 43, Banbury-road, Oxford, to reach him by 16th February.

PORTSMOUTH. QUEEN ALEXANDRA HOSPITAL. (87 acute surgical beds.) PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of SURGICAL REGISTRAR at above Hospital, vacant early March. Prefer holder of post be resident.

Forms of application may be obtained from the Group Secretary, Saint Mary's Hospital, Milton-road, Portsmouth, which should be returned to him duly completed on or before 11th February, 1957. Canvassing will disqualify. Candidates may visit the above Hospital by arrangement with the Group Secretary.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE.

Royal Portsmouth Hospital
HOUSE SURGEONS. 70 Beds. Pre-registration posts. Vacant 1st March.

Orthopædic Department
HOUSE OFFICER (pre-registration post), vacant 27th February.
Locum SENIOR HOUSE OFFICER for 3–4 months from 11th February.

St. Mary's Hospital (130 surgical beds)
2 HOUSE SURGEONS (pre-registration) vacant now.

Applications, stating age, experience and qualifications, together with the names of 2 referees, should be forwarded as soon as possible to E. H. HURST.
St. Mary's Hospital, Milton-road, Portsmouth.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL, Greenbank-road. SENIOR HOUSE OFFICER in Surgery, vacant immediately. Recognised for the F.R.C.S.

Applications, stating age, nationality, qualifications, and experience, together with the names and addresses of 3 referees, to be sent to the undersigned as soon as possible.
F. HALL, Deputy Group Secretary, Plymouth,
South Devon and East Cornwall General Hospital Group.
7, Nelson-gardens, Stoke, Plymouth.

READING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (Area Accident and Orthopædic Department), vacant immediately. Recognised for F.R.C.S. Duties including work in area Casualty Department at Battle Hospital, Reading (300 Beds). Person appointed will work with Registrar and House Officers.

Apply, stating nationality, present post and qualifications with dates, together with names of 2 referees, to Group Secretary, 3, Craven-road, Reading.

READING AREA DEPARTMENT OF MEDICINE. Applications are invited from registered and provisionally registered medical practitioners for 2 posts as RESIDENT HOUSE PHYSICIAN, vacant 1st March, 1957, for a period of 6 months. Successful candidates will be required to carry out duties at the following Reading Hospitals: Royal Berkshire (398 Beds), Battle (374 Beds), and Prospect Park (104 Beds).

Write before 19th February, stating age, qualifications with dates, nationality, present post, with copy of 2 recent testimonials, to Secretary, Royal Berkshire Hospital, Reading.

READING. ROYAL BERKSHIRE HOSPITAL. (398 Beds.) Applications are invited from registered and provisionally registered medical practitioners for the resident post of HOUSE PHYSICIAN in the Pædiatric Department, vacant 1st March, 1957, and tenable for 6 months.

Write immediately, stating age, qualifications with dates, nationality, present post, with copy of 1 recent testimonial, to Secretary.

RICHMOND, SURREY. ROYAL HOSPITAL. (Acute General Hospital—121 Beds.) Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER in Surgery. Post vacant with effect from 10th March, 1957.

Applications, with names of 2 referees, to Administrative Officer.

ROCHDALE AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required immediately at the Rochdale Infirmary, pre- or post-registration applicants eligible. Post recognised for F.R.C.S.

Apply at once to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale.

ROCHDALE AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. BIRCH HILL HOSPITAL. HOUSE OFFICER (obstetrics and gynæcology) post vacant late February. Pre-registration post of 6 months duration. Recognised for D.Obst.R.C.O.G.

Apply to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale, at once.

ROCHDALE GROUP OF HOSPITALS invites applications from newly qualified medical practitioners for 1 year rotating PRE-REGISTRATION posts. The first 6 months will be spent as House Surgeons in the Rochdale Infirmary (2 months casualty, 4 months general surgery) and the second 6 months as House Physicians or Obstetric and Gynæcological House Surgeons. 3 posts vacant shortly.

Immediate applications to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) SENIOR HOUSE OFFICER (neurosurgery) required immediately. Suitable for candidates seeking higher medical or surgical qualifications. Recognised for the F.R.C.S. (Eng.).

Apply to Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford, as soon as possible.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) SENIOR HOUSE OFFICER (resident or non-resident) required for duties in the Casualty Department. Available for Male or Female applicants. This is a large General Hospital with specialised departments dealing with all types of acute medical and surgical cases. The post affords good opportunity for gaining tuition and experience.

Applications should be forwarded immediately to the Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. VICTORIA HOSPITAL. (99 Beds.) RESIDENT HOUSE SURGEON (Male) required immediately. Post not approved for pre-registration purposes.

Applications should be forwarded immediately to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time non-resident post of SURGICAL REGISTRAR to the Inverness Hospitals.

Further particulars and application schedules can be obtained from the undersigned, with whom applications should be lodged by 23rd February, 1957.

A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

SCOTLAND. NORTHERN REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time resident post of REGISTRAR in Psychiatry at Craig Dunain Hospital, Inverness.

Forms of application and further particulars may be obtained from the undersigned with whom applications should be lodged by 11th February, 1957.

A. M. FRASER, M.D.,
Secretary and Administrative Medical Officer.
Office of the Northern Regional Hospital Board,
Raigmore, Inverness.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. REGISTRAR in Surgery to the Edinburgh Northern Group of hospitals. The person appointed must be prepared to devote a part of the period of his appointment to duty in the Surgical Paediatric Units of this Group.

Apply, giving particulars of age, qualifications and previous experience, and the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 23rd February.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments, which will be for 1 year in the first instance:—

SENIOR REGISTRAR in Orthopædics based at the Western Infirmary, Glasgow.

2 REGISTRARS in Obstetrics and Gynæcology for duties on a rotational basis at the Victoria Infirmary/Robroyston Hospital, Glasgow, and at Falkirk and District Royal Infirmary.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, by 16th February, 1957.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS AND SHEFFIELD REGIONAL HOSPITAL BOARD. SHEFFIELD CENTRE FOR THE INVESTIGATION AND TREATMENT OF RHEUMATIC DISEASES. Applications invited for the non-resident post of REGISTRAR or SENIOR HOUSE OFFICER to the above Centre. Grade according to qualifications and experience. Previous study of rheumatic diseases not necessary but an interest in research essential.

Applications, stating age, qualifications, and experience, with the names of 3 referees, should be sent at once to the Chief Administrative Officer, The United Sheffield Hospitals, Westwood-street, Sheffield, 1.

SHREWSBURY. ROYAL SALOP INFIRMARY AND COPTHORNE HOSPITAL. (500 Beds.) RESIDENT ANÆSTHETIST (Senior House Officer). Post recognised for F.F.A.R.C.S. Registrar also employed. Vacant end of January.

Applications and copy testimonials to Group Secretary, Shrewsbury Hospital Group Royal Salop Infirmary, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY/COPTHORNE HOSPITAL. (500 Beds.) HOUSE SURGEON, vacant 1st March, 1957. Pre-registration candidates eligible. Recognised for the F.R.C.S.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SKIPTON GENERAL HOSPITAL, Skipton, Yorkshire. (64 Beds.) SENIOR HOUSE OFFICER (surgical) required, vacant now. Salary £745, less £150 if resident. Accommodation for single person available at Hospital.

Applications, with full particulars as to age, nationality, qualifications, and experience, &c., and copies of testimonials, to be sent to Group Secretary, Hospital Management Committee 17, St. John's Hospital, Keighley.

SOUTHALL, MIDDLESEX. ST. BERNARD'S HOSPITAL FOR NERVOUS AND MENTAL DISORDERS. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR required at above Hospital which undertakes all modern psychiatric treatments both physical and psychotherapeutic, and the medical staff conduct several psychiatric outpatient clinics. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, the Group Secretary, St. Bernard's Hospital Management Committee, St. Bernard's Hospital, Southall, Middlesex, by 15th February, 1957.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (278 Beds.) RESIDENT HOUSE SURGEON required beginning February. Pre-registration candidates eligible.

Applications, with copies of recent testimonials, should be forwarded to Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

STOCKTON-ON-TEES. THE CHILDREN'S HOSPITAL, Durham-road, STOCKTON-ON-TEES. (84 Beds.) CLEVELAND HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER. The appropriate salary and conditions of service being in accordance with the Ministry of Health regulations.

Applications, with copies of 2 recent testimonials, should be forwarded to the undersigned at West Lane Hospital, Middlesbrough, as early as possible.

L. BRITTAIN, Group Secretary.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. (455 Beds.) SENIOR HOUSE OFFICER in Orthopædics. Recognised F.R.C.S.

Applications, with names of 2 referees, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. HOUSE OFFICER (general surgery) required. Pre-registration post. Hospital recognised for F.R.C.S.

Detailed applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. (845 Beds. Recognised for F.F.A.R.C.S. and D.A.) STOKE-ON-TRENT HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER in Anæsthetics. Post vacant 1st April, 1957. Previous anæsthetic experience desirable, but not essential. The post offers experience in anæsthesia for all types of general surgery, thoracic and cardiac surgery, including an Obstetric Unit of 60 Beds. Staff includes a Senior Registrar who shares in emergency duties.

Applications, with copy testimonials, to the Group Secretary, Stoke-on-Trent Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. HOUSE OFFICER (general surgery) required. Pre-registration post. Hospital recognised for F.R.C.S.

Detailed applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

SOUTHEND GENERAL HOSPITAL. Locum Surgical REGISTRAR required for the period 25th February–10th March, 1957, inclusive.

Applications, stating age, qualifications and experience, should be sent to the undersigned as soon as possible.

J. C. FIELD, Secretary.

SOUTHEND GENERAL HOSPITAL. Applications are invited for appointment as SENIOR HOUSE OFFICER to the Orthopædic and Fracture Department. Post vacant 9th March, 1957. The Orthopædic and Fracture Department is the centre for reference of all cases from a large surrounding area, and the post offers excellent experience in all aspects of orthopædic and traumatic surgery under the supervision of and with instructions from the Consultant-in-charge. Post recognised for the F.R.C.S. Resident or non-resident.

Applications, stating age, qualifications and experience, together with copies of recent testimonials, should be sent to the undersigned by 14th February, 1957.

J. C. FIELD, Secretary.

STAFFORD. STAFFORDSHIRE GENERAL INFIR-MARY. RESIDENT CASUALTY OFFICER (Junior Hospital Medical Officer status) required. Male or Female.

Applications, stating age, previous experience and copies of 2 recent testimonials, to the Group Secretary, Stafford Hospital Management Committee, 13, Foregate-street, Stafford.

STOCKPORT. STEPPING HILL HOSPITAL. Applica-tions are invited for the post of RESIDENT SENIOR HOUSE OFFICER (medicine), vacant 1st March, 1957.

Applications, stating age, experience and qualifications, together with copies of 2 testimonials, to be addressed to the Group Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport.

SWANSEA HOSPITAL, Swansea. (403 Beds.) Glantawe HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of Pre-registration HOUSE OFFICER in the Surgical Unit of the above Hospital. Immediate vacancy.

Applications with full particulars should be addressed to the Hospital Secretary. T. E. JONES, Group Secretary.

SUTTON AND CHEAM HOSPITAL, Cotswold-road, SUTTON, SURREY. HOUSE SURGEON (pre-registration or fully registered), vacant now.

Applications, stating age, experience and qualifications, with copies of recent testimonials and the names of 2 referees, should be sent to the Secretary at above address.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE SURGEON required for Unit of Obstetrics and Gynæcology, vacant 7th March. Post recognised for M.R.C.O.G.

Applications, stating age, experience and qualifications with dates, with copies of 2 testimonials, to Secretary.

TREDEGAR, MONMOUTHSHIRE GENERAL HOS-PITAL. (20 miles from Newport and 24 from teaching hospital at Cardiff ; 6 miles from Vale of Usk.) Applications are invited for post of HOUSE SURGEON. Preference given to pre-registration candidates. Surgical unit of 50 Beds and 6 orthopædic beds under daily supervision of Consultant Surgeon and visiting supervision of Orthopædic Surgeon. Busy Outpatient, Casualty and Radiological Departments. Married quarters.

Apply to Group Secretary, address as above by 20th February.

TUNBRIDGE WELLS, KENT AND SUSSEX HOSPITAL. (303 Beds.) Applications invited for post of SENIOR HOUSE OFFICER (casualty), Male or Female. Recognised F.R.C.S. Vacant 28th February, 1957.

Apply, giving age, qualifications, experience, with names of 2 referees, to Group Secretary, Sherwood Park, Pembury-road, Tunbridge Wells.

UXBRIDGE CHEST CLINIC, High-street, Uxbridge, MIDDLESEX. MEDICAL REGISTRAR required for duties including clinical work, also supervision of patients at Hillingdon Hospital (30 Beds). Candidates require experience in general medicine and some experience in treatment of tuberculosis and diseases of chest. Further details from Physician-in-charge. Clinic may be visited by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, Uxbridge Group Hospital Management Committee, The Furze, Pield Heath-road, Hillingdon, Middlesex, by 12th February.

WARWICK (near). KING EDWARD VII MEMORIAL CHEST HOSPITAL. (228 Beds.) SENIOR HOUSE OFFICER (resident desirable). Hospital is modern with Thoracic Surgical Unit.

Applications to Medical Superintendent.

VIRGINIA WATER, SURREY. HOLLOWAY SANA-TORIUM. Locum Tenens JUNIOR HOSPITAL MEDICAL OFFICER required at above Psychiatric Hospital for a period of 18 weeks to commence immediately. Salary on Whitley scale, £17 10s. per week.

Apply as soon as possible to the Physician-Superintendent.

WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL. Fully registered HOUSE OFFICER required for the Gynæcological Department. £525 p.a. Residential accommodation at charge of £125 p.a.

Address written applications, giving full particulars of experience, &c., and 2 names and addresses for reference, to—

W. BOWRING, Group Secretary.

Victoria Chambers, Wood-street, Wakefield.

WATFORD, HERTFORDSHIRE. PEACE MEMORIAL HOSPITAL. Applications are invited for the post of RESIDENT ANÆSTHETIST (Senior House Officer grade) to the Watford Hospitals.

Applications, together with copies of not more than 2 recent testimonials, to the Administrator.

WATFORD, HERTFORDSHIRE. PEACE MEMORIAL HOSPITAL. CASUALTY OFFICER (Senior House Officer). Modern Department employing 3 full-time Casualty Officers. Post recognised for F.R.C.S. Resident or non-resident. Vacant mid-February.

Applications, with names of 2 referees, to the Administrator.

WATFORD. SHRODELLS HOSPITAL. Applications are invited for the post of HOUSE OFFICER (Senior House Officer grade), to the Prædiatric Unit of 38 Beds, to take up duty about 1st March. Post recognised for the D.C.H.

Applications, together with copies of 2 recent testimonials, should reach the Medical Officer-in-charge as soon as possible.

WEST BROMWICH. HALLAM HOSPITAL. (450 Beds.) WEST BROMWICH AND DISTRICT HOSPITALS GROUP. HOUSE SURGEON, vacant immediately. Pre-registration.

Applications, with 3 recent testimonials, to the Medical Secretary at the above address.

WESTON-SUPER-MARE GENERAL HOSPITAL. CASUALTY OFFICER (Senior House Officer grade) required for the above Hospital. The appointment is recognised for F.R.C.S. examinations.

Applications, stating age, qualifications, and experience, together with the names and addresses of 2 referees, should be addressed to the Group Secretary, Weston-super-Mare Hospital Management Committee.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOS-PITAL. (315 Beds.) HOUSE SURGEON to the Senior Surgeon. Post vacant immediately.

Applications, with copies of 2 testimonials, to be sent to the Group Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOS-PITAL. (315 Beds.) HOUSE SURGEON (post recognised by Royal College of Surgeons) required for general surgery with some E.N.T. duties. Approved pre-registration post. Vacant 27th February.

Applications, with copies of 2 testimonials, to the Group Secretary.

WINDSOR CHEST CLINIC. Registrar required. Good training in general medicine essential and special experience in chest diseases desirable. This Clinic, which may be visited by direct arrangement with Physician-in-charge, has 50 Beds attached, and is in close contact with Harefield and Pinewood Chest Hospitals.

Application forms from, and returnable to, Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, by 17th February.

WINDYGATES, FIFE. CAMERON I.D. HOSPITAL. CHEST UNIT. (30 Beds.) RESIDENT HOUSE OFFICER required to take up duties forthwith. The post qualifies for pre-registration. Salary in accordance with national scale.

Apply, with copies of recent testimonials, to the Medical Superintendent, East Fife Hospitals Board of Management, 243A, High-street, Kirkcaldy.

WOLVERHAMPTON. THE ROYAL HOSPITAL. (An Associated Hospital of the Birmingham University Medical School.) HOUSE OFFICER (pre-registration), E.N.T. Department, recognised for the D.L.O. and F.R.C.S. examinations, vacant February.

Apply Secretary, with copies of testimonials.

CANADA. OTTAWA CIVIC HOSPITAL, Ottawa (general—800 Beds), invites applications to fill an appointment as RESIDENT in Medical Department. This is a senior appointment for a man who proposes to write Fellowship examinations in Canada in the field of internal medicine and the appointment involves teaching of final year medical students and graduate interns. Salary $200 per month, plus room and board.

Applications, stating age, qualifications, experience, and names of 2 referees, should be forwarded to Superintendent, Ottawa Civic Hospital, Ottawa, Canada.

CANADA. REGINA GENERAL HOSPITAL, Regina, SASKATCHEWAN. Vacancies exist for appointments as RESIDENT and ASSISTANT RESIDENT in Services of Pathology, Prædiatrics and Obstetrics/Gynæcology in 800-Bed General Hospital. All services very active. Stipend of $175 per month for Assistant Resident ; $225 for Resident. Full maintenance provided.

Apply Superintendent, Regina General Hospital, Regina, Saskatchewan.

NEW YORK. ALBANY HOSPITAL, Albany, New York, U.S.A. PSYCHIATRY RESIDENCIES available in 655-Bed University-teaching General Hospital with 60-Bed acute treatment Psychiatric Unit fully approved for 3 years training. Experience includes dynamically-oriented psychotherapy with children and adults, shock therapies, and neurologic training Salary range $3000–$4000 annually.

Address inquiries to Medical Director.

U.S.A. ELMHURST GENERAL HOSPITAL, Elmhurst, NEW YORK, U.S.A. (960 Bed general municipal hospital, formerly New York City Hospital.) Approved by the Joint Commission on Accreditation of Hospitals. Also approved by the American College of Surgeons and American Medical Association for Interneship and Residency training. Only graduates from approved university schools accepted. Several openings in Rotating and Straight INTERNESHIPS and a few first and second year RESIDENCIES are available for the term commencing 1st July, 1957. Stipend for Internes is $855 per year plus complete maintenance.

Apply to Chairman of Interne and Resident Committee.

B.W.I. UNIVERSITY COLLEGE HOSPITAL OF THE WEST INDIES. Applications are invited for the post of REGISTRAR in the Department of Diagnostic Radiology, vacant April, 1957, at the above-named Teaching Hospital, which is in special relationship with the University of London. Preference will be given to candidates holding a Diploma in Diagnostic Radiology. The appointment will be for 1 year in the first instance, subject to renewal. Salary will be in the scale £900–£100–£1100 : £1200–£100–£1500 p.a., depending on experience and qualifications. Single accommodation and board are provided at a deduction from salary of £145 p.a., or if available, an unfurnished flat may be provided at 5% of salary. Return passage by sea will be paid for 1 person only.

Further information may be obtained from the Hospital Manager and Secretary, University College Hospital, Mona P.O., Jamaica, B.W.I., to whom applications, stating age, nationality, qualifications and details of previous experience, together with 3 recent testimonials or the names and addresses of 3 referees and including the date on which the candidate would be available, should be sent by the earliest possible date.

Public Appointments

DUBLIN. LOCAL APPOINTMENTS COMMISSION. Vacancies for Resident Medical Superintendents and Senior Assistant Medical Officers of Mental Hospitals.

(1) RESIDENT MEDICAL SUPERINTENDENTS : (*a*) Carlow, (*b*) Clonmel, (*c*) Ennis, (*d*) Waterford District Mental Hospitals. Inclusive salary for each post £1493–£1653 plus emoluments value £130. Age limits 35–50 years with extensions in certain cases.

(2) SENIOR ASSISTANT MEDICAL OFFICERS : (*a*) Grangegorman, (*b*) Waterford, (*c*) Cork, (*d*) Letterkenny District Mental Hospitals. Inclusive salary for each post £982–£1168 plus emoluments value £168. Higher initial salary in certain cases. Age limits 30–50 years with extensions in certain cases.

Application forms and particulars from the Secretary, 45, Upper O'Connell-street, Dublin. Latest time for receiving completed application forms 5 P.M. on 19th February, 1957.

GLOUCESTERSHIRE COUNTY COUNCIL. Applications are invited for the appointment of ASSISTANT COUNTY MEDICAL OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER. Salary £1050 p.a.–£1475 p.a. Commencing salary will be determined on previous experience. Applicants must be registered medical practitioners and possession of a Diploma or Certificate in Public Health would be an advantage. Superannuable post : medical examination. Car driver and should possess a motor-car.

Forms of application, with conditions, obtainable from County Medical Officer of Health, Berkeley House, Berkeley-street, Gloucester, to whom completed applications should be sent by 23rd February, 1957. Canvassing disqualifies.

GUY H. DAVIS, Clerk of the County Council.

GOVERNMENT OF WESTERN NIGERIA. Applications invited from male doctors for the following posts in the Medical Department of the Western Region of Nigeria :—

MEDICAL OFFICERS OF HEALTH who will normally be based at 1 of the larger urban centres in the Region, where they will be primarily responsible for public health administration of the area, with special emphasis on sanitation and hygiene. Duties include school health, public health, education and propaganda, control of quarantinable diseases, and may also include establishment and supervision of maternity, child welfare and tuberculosis centres. A candidate with special aptitude and inclination for teaching may be selected to take charge of the new School of Hygiene for training of sanitary inspectors, which is being established in Ibadan. Candidates should possess a Diploma in Public Health.

PATHOLOGIST who will be responsible for a Regional Laboratory Service which he will have to organise. Most hospitals in Region have small laboratories attached where routine work is performed, but the more complicated tests, sections, &c., will be the selected officer's concern at a Central Regional Laboratory. He will have to supervise and encourage the work of African Technicians which will necessitate travelling. Candidates should possess Diploma in Pathology or equivalent qualification, and have had 2 years experience in laboratory work.

Appointment may be made as follows :—

(*a*) From the National Health Service, retaining superannuation rights up to 6 years. Salary scale for appointment on these terms is £1086–£1950 a year. A gratuity (taxable) of 20% of aggregate of salary is payable on completion of appointment, or

(*b*) On short-term contract (2 tours each of 18–24 months duration). Salary in scale £1170–£2118 a year. A gratuity (taxable) at rate of £37 10s. for each completed period of 3 months service (including leave) payable on satisfactory completion of appointment.

In addition, officers receive supplementary pay of £120 a year.

Quarters provided at low rental. Taxes at local rates. Annual leave permissible ; generous home leave granted after each tour of 18–24 months. Free passages for Officer, wife, and children (up to 3).

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting No. BCD.117/410/08).

GOVERNMENT OF TRINIDAD. Medical Officers required primarily for duties in Mental Hospital. Appointments on permanent basis with pension (non-contributory). Candidates from National Health Service may retain superannuation rights during time in Trinidad (up to 6 years) and receive gratuity (taxable) of 20% of aggregate salary on leaving oversea employment. Salary scale B.W.I. $6720–$7200 (£1400–£1500) a year. Pension 1/600th of final pensionable emoluments for each completed month of service. Quarters at low rental when available or allowance in lieu. Free passages on appointment for Officer, wife, and dependent children under 18 years not exceeding 5 persons in all and on leave up to maximum of 3 adult fares. Income-tax at local rates. Generous leave. Educational facilities available. Candidates must possess qualifications registrable in United Kingdom, also Diploma in Psychological Medicine and 3 years postgraduate experience of psychological medicine, 2 of which should have been spent working in a mental hospital.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting No. BCD.117/38/05).

GOVERNMENT OF BARBADOS. Medical Registrar with qualifications registrable in United Kingdom, and either postgraduate qualification or at least 4 years experience in hospital ward, outpatient clinic or special departments, required for General Hospital. Duties as follows :—Physician Specialist wards and rounds (covering holidays), post-mortems, Medical outpatients (new cases), blood organisation, second string night emergencies and 1 Sunday a month Casualty Officer. Other duties at discretion of Director of Medical Services. Appointment on agreement for 3 years or, for bachelor only, on 1 year agreement (renewable). If latter return passage for officer only. Salary scale £1300–£1500 p.a. Employer's share of approved Superannuation contributions will be paid. Income-tax at local rates. Assisted passages to Barbados, and back on satisfactory completion of engagement, for Officer, wife, and dependent children under 18 years subject to a maximum of £400 each way, inclusive of baggage allowance. Educational facilities available.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting No. BCD.117/28/015).

HERTFORDSHIRE COUNTY COUNCIL. Assistant. COUNTY MEDICAL OFFICER. Diploma in Public Health or Child Health desirable, but not essential. Salary £1050–£1475. Car necessary. Travelling and subsistence according to national scale.

Application forms and further particulars from County Medical Officer, County Hall, Hertford. Forms to be returned by 16th February.

KINGSTON UPON HULL. CITY AND COUNTY OF KINGSTON UPON HULL. Applications are invited for the appointment of SENIOR MEDICAL OFFICER on the staff of the Health Department. The Officer appointed will be responsible for the coördination of all the care and aftercare schemes of the Department including vaccination and immunisation, mental health, sociological investigation, recuperative holidays, &c. In addition the Officer will be given an opportunity of gaining experience in Port Health Administration. The salary scale (£1520–£50(1)–£55(7)–£1955 p.a.) and conditions of service will be in accordance with the appropriate Whitley Council agreements, and the Officer will receive an essential user car allowance.

Particulars of the appointment and forms of application may be obtained from the Medical Officer of Health, Guildhall, Kingston upon Hull, to whom completed application forms must be returned not later than 11th February, 1957.

NATIONAL COAL BOARD. North-Eastern Division. Applications are invited for 2 posts of ASSISTANT AREA MEDICAL OFFICER in No. 4 (Carlton) Area and No. 8 (Castleford) Area. Candidates should preferably be aged about 30 years and have experience in the field of preventive and industrial medicine, and a knowledge of the Coal Mining Industry will be an advantage. The work will include making underground visits at collieries. Salary according to qualifications and experience will be within the range of £1100–£1600 p.a. Candidates with a fair amount of postgraduate experience will not be paid less than £1200.

Detailed applications, giving the names of 2 referees, should be sent to the Staff Director, National Coal Board, Holmwood House, Ecclesall-road South, Sheffield, 11, by 16th February, 1957. Mark envelopes "Staff Vacancy."

SHEFFIELD. CITY OF SHEFFIELD. Public Health DEPARTMENT. Applications are invited for the post of ASSISTANT MEDICAL OFFICER for maternity and child welfare, on the staff of the Medical Officer of Health, Dr. Llywelyn Roberts, from whom further particulars may be obtained (P.O. Box 78, Town Hall Chambers, Sheffield, 1). Candidates should have experience or special qualifications in either child welfare or obstetrics. Post superannuable ; medical examination. Salary scale £1050–£50–£1200–£55–£1475 p.a.

Applications, giving age, qualifications, experience, present and previous appointments with dates, names of 3 referees, and endorsed "Assistant Medical Officer (M.C.W.)," to be forwarded by 11th February, 1957, to JOHN HEYS, Town Clerk.

Town Hall, Sheffield, 1.

STATE OF QUEENSLAND, Australia. Appointments to Medical Staff. Applications, addressed to the Agent-General for Queensland, 409/410, Strand, London, and closing on 1st March, 1957, are invited from duly qualified medical practitioners of Great Britain and Northern Ireland for appointment to positions as JUNIOR MEDICAL OFFICER in Queensland hospitals. Successful applicants will be given limited registration if they have not completed their full hospital year after graduation : otherwise full registration will be granted. The salary for a graduate in the first year after graduation is A£1272 p.a. Board and lodging provided free.

Applications should include particulars of marital status, age, experience and date available, together with copies of testimonials.

PROVINCE OF NOVA SCOTIA, CANADA

PATHOLOGIST

Applications are invited from qualified Pathologists for the position of Director of the Cape Breton Branch Laboratory. This is a recently constructed branch of the Province Laboratory and is situated in a 235-Bed general hospital in Sydney, Nova Scotia. Salary $10,000–$12,000 p.a.

Further information concerning duties and living conditions may be obtained from Dr. W. A. TAYLOR, 62 University-avenue, Halifax, Nova Scotia, Canada, to whom applications, with names of 2 referees, should be submitted in duplicate.

TREASURY MEDICAL SERVICE. Applications are invited from medical practitioners, practising in the districts detailed below, for appointment, in a part-time and mainly advisory capacity, as LOCAL TREASURY MEDICAL OFFICER for each of the places or groups of places shown. The town shown in brackets after the place-names indicates the Head Post Office Area in which the place, or group of places, is situated. Successful applicants will be required to examine and report on the condition of certain Government Officers, teachers, candidates for appointment, &c., who may be referred to them from time to time; and to attend when summoned to an emergency case of accident or sudden illness occurring in a Government office in the neighbourhood. Fees for this work, and mileage allowance where necessary, will be paid on a scale agreed with the British Medical Association.

Intending applicants should write, within 14 days, to Treasury Medical Adviser, Treasury Chambers, Whitehall, S.W.1, for a form on which application may be made. Applicants should be not more than 60 years of age.

The places for which applications are invited are as follows :—

ENGLAND AND WALES

Knutsford (Altrincham).
Goole (Goole).
Liverpool, 6.
Victoria Docks and North Woolwich, London, E.16.
Dudley (Newcastle-on-Tyne).
Waterfoot (Rossendale).
Burgh-le-Marsh (Skegness).

SCOTLAND

Turriff (Banff).
Gairloch, Melvaig, Strath and North Erradale (Dingwall).
Bruichladdich, Isle of Islay (Port Ellen).

NORTHERN IRELAND

Jerrettspass and Poyntzpass (Newry).

YORKSHIRE. DIVISIONAL ADMINISTRATION OF THE PREVENTIVE MEDICAL SERVICE IN THE ADMINISTRATIVE COUNTY OF THE WEST RIDING OF YORKSHIRE. Appointment of MEDICAL OFFICER OF HEALTH AND DIVISIONAL MEDICAL OFFICER to Todmorden Borough, Hebden Royd, Sowerby Bridge, and Ripponden Urban and Hepton Rural District Councils and the County Council of the West Riding of Yorkshire. Applications are invited from registered medical practitioners who must also be registered in the Medical Register as the holder of a Diploma in Sanitary Science, Public Health, or State Medicine, for the above-mentioned whole-time appointment. The effect of the "mixed" appointment will be to secure that the planning of the day-to-day administration and the execution of practically all public health matters of the division will be in the hands of 1 person, the Divisional Medical Officer of Health. A Divisional Public Health Office with necessary staff will be provided.

The salary attached to the post is as follows :—

(*a*) For Medical Officer of Health duties : £973 15s. 0d.–£27 10s. 0d. (4)–£1083 15s. 0d.

(*b*) For County Council duties : £981 5s. 0d.–£31 5s. 0d. (1)–£34 7s. 6d. (7)–£1253 2s. 6d.

In addition there will be a travelling and subsistence allowance at the rate of £180 p.a.

The appointment will be made jointly by the District Councils and the County Council and the person appointed will not be permitted to engage in private practice.

Forms of application containing particulars of duties and terms and conditions of service may be obtained from the County Medical Officer, County Hall, Wakefield, to whom completed forms must be returned not later than 20th February, 1957. Canvassing of members of the appointing bodies directly or indirectly will disqualify any candidate for the post.

J. D. MOYS, Town Clerk, Todmorden.
J. WOOD-WILSON, County Medical Officer.

STOKE-ON-TRENT. CITY OF STOKE-ON-TRENT. Applications are invited for the appointment of SENIOR MEDICAL OFFICER (maternal and child welfare) from registered medical practitioners (Women) holding a Diploma in Public Health, and having had extensive experience in maternal and child welfare, and general public health work. The salary will be on the Whitley Council scale £1520–£50–£55(7)–£1955. The person appointed will be responsible, under the direction of the Medical Officer of Health, for carrying out the administrative duties of the maternal and child welfare section of the Public Health Department, and any such duties as the Medical Officer of Health may from time to time determine. The appointment will be subject to the provisions of the National Health Services (Superannuation) Regulations, 1947, and the successful candidate will be required to pass a medical examination.

Applications (no forms) in envelopes endorsed "Senior Medical Officer (Maternal and Child Welfare)," together with copies of 3 recent testimonials or names of 3 referees, to be delivered to the Medical Officer of Health, Public Health Department, St. Peter's Chambers, Glebe-street, Stoke-on-Trent, not later than Tuesday, 5th February, 1957.

HARRY TAYLOR, Town Clerk.

STOKE-ON-TRENT. CITY OF STOKE-ON-TRENT. Appointment of ASSISTANT MEDICAL OFFICER OF HEALTH. Applications are invited from qualified medical practitioners (Women) for the post of Assistant Medical Officer on the Maternity and Child Welfare Services. Candidates should have experience in diseases of children and obstetrics. Opportunity will be given for hospital contact with pædiatrics and obstetrics. The possession of a D.P.H. or D.C.H. will be considered an additional qualification. The salary will be in accordance with the Whitley Council scale, commencing according to experience. The appointment will be subject to the provision of the National Health Services (Superannuation) Regulations, 1947, and the successful candidate will be required to pass a medical examination.

Forms of application may be obtained from the Medical Officer of Health, Public Health Department, Glebe-street, Stoke-on-Trent, and should be returned, accompanied by copies of not more than 3 recent testimonials, not later than Saturday, 16th February, 1957. HARRY TAYLOR, Town Clerk.

WESTERN REGION OF NIGERIA. Specialist Physician required. Duties mostly at Adeoyo Hospital, Ibadan, but will include visits in consulting capacity to other hospitals in the Region. Candidates must possess medical qualifications registrable in United Kingdom and M.R.C.P. or equivalent, with at least 6 years post-registration experience in specialist medical appointments. Special knowledge of tropical medicine desirable but not essential.

Appointment may be :—

(*a*) From the National Health Service, candidate retaining superannuation rights up to 6 years and receiving a gratuity (taxable) of 20% of aggregate of salary, or

(*b*) On short-term contract (1 tour in first instance of 12–24 months duration according to age).

Salary under (*a*) £2220 a year, and (*b*) £2664 and gratuity (taxable) on satisfactory completion of contract at rate of £37 10s. for each completed period of 3 months' service (including leave). Officer appointed under (*b*) required to contribute to Widows' and Orphans' Pension Scheme.

Quarters provided at low rental. Taxes at local rates. Annual leave permissible; generous home leave granted after each tour of 18–24 months. Free return passages for Officer, wife, and children (up to 3).

Application forms from Director of Recruitment, Colonia Office, London, S.W.1 (quoting No. BCD.117/410/027).

General Practice

For an **Executive Council post** *(England and Wales) apply on form* **E.C.16A** *obtainable from the council. Mark envelope "Vacancy."*

SOUTHAMPTON. Applications invited for Vacancy (urban), list approximately 1140. Retiring doctor practises from residence and branch surgery, both of which, it is understood, will be available for purchase. Applications per Form E.C.16A must be received by the Council not later than 11th February next.

C. A. BLUNDY, Clerk, Southampton Executive Council.
5, Rockstone-place, Southampton.

Miscellaneous

May & Baker Ltd., Dagenham, Essex, chemical manufacturers. Applications are invited from Male registered medical practitioners aged about 30 years, for appointment as Assistant Works Medical Officer. Candidates should have a good clinical background and an interest in industrial medicine. The additional qualification of D.P.H. or D.I.H. is desirable but not essential. Salary according to B.M.A. scale. Contributory pension scheme.—Applications, giving full details of qualifications and experience, together with the names of 3 referees, should be sent to the Personnel Officer, quoting reference No. 28.

Malaya. A Resident Medical Officer is required for a Tin Mining Company, near Kuantan, East Coast of Malaya in the State of Pahang. Monthly salary at rate of Str. $1500–$100–$1700 on initial 3-year engagement. If married, a monthly allowance of Str. $150 is paid. Passages, furnished accommodation, home leave, pension scheme apply. Tropical, clinical and hygiene experience an advantage.

Applications with full particulars to Box No. 639, c/o CHARLES BARKER & SONS LTD., Gateway House, London, E.C.4.

Wanted, by well-established Clinic in Southern Alberta, a Pædiatrician, young man with D.C.H. preferred. State qualifications, and pertinent personal data.—Write, Address, No. 274, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

To Medical Societies, Hospital Committees, &c. A small Conference-room (20–30) is available in the centre of the London medical world, beautifully furnished with full service. Evenings only.—Apply : H. RICHARDS (MANAGEMENT) LTD., 30, New Cavendish-street, W.1 (Tel. : WELbeck 7561).

"Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimen of urine and £1 1s. fee. Hæmatology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE LTD., 98, Victoria-street, S.W.1 (Phone : VICtoria 0141), who are specialists in this kind of work.

Typewriting and Duplicating. First-class work at moder-ate prices by experienced medical typists. Electric machines. —SYBIL RANG, 21, Heath-street, Hampstead, London, N.W.3 (HAM 5329/0504).

Microscopes. Highest prices paid for good modern types. Send or bring your equipment for valuation.—WALLACE HEATON LTD., 127, New Bond-street, W.1.

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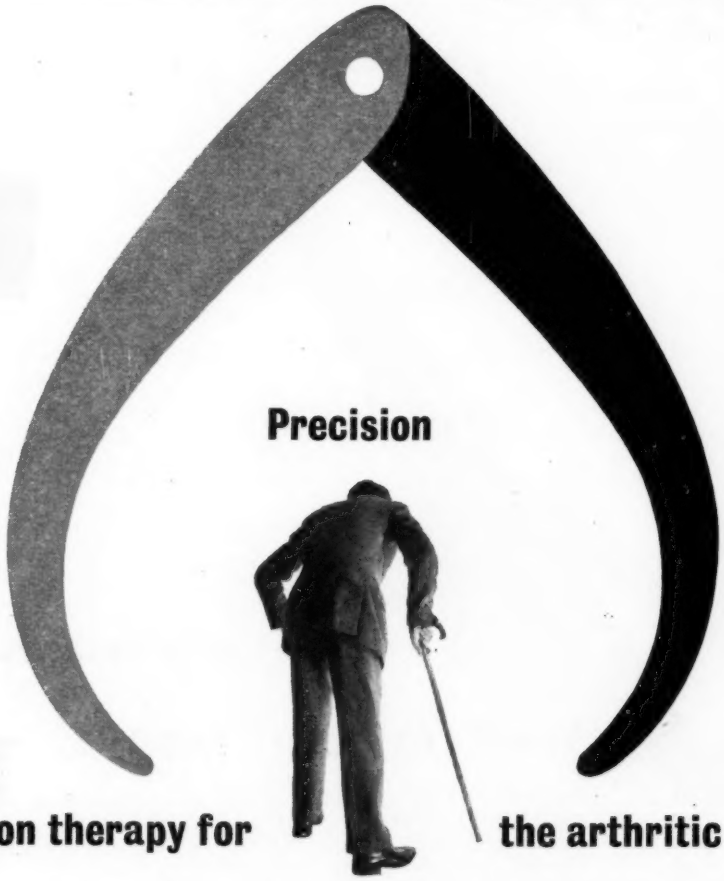

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Iron?—"Blood transfusions have been given with good results but improvement has been transient".

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Intravenous iron?—". . . the difficulty of giving such injections to patients with joint deformity is a drawback as well as the liability to cause unpleasant side reactions".

Intramuscular iron?—"Clearly, an iron preparation for intramuscular injection free from side effects and fairly rapidly absorbed would be a great advantage . . . . It is concluded that . . . in the treatment of the anaemia of rheumatoid arthritis . . . intramuscular iron is as beneficial as intravenous iron and easier to administer." Ann. Rheum. Dis., 1956, **15**, 51.

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When the case calls for penicillin let Penicillin-V Lilly—the penicillin that "passes the acid test"—be your choice.

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